THE LAW OFFICE OF JACK FITZGERALD, PC
JACK FITZGERALD (257370)
jack@jackfitzgeraldlaw.com
TREVOR M. FLYNN (253362)
trevor@jackfitzgeraldlaw.com
TRAN NGUYEN (310593)
tran@jackfitzgeraldlaw.com
Hillcrest Professional Building
3636 4th Ave., Ste. 202
San Diego, CA 92103
Phone: (619) 692-3840
Fax: (619) 362-9555

LAW OFFICES OF RONALD A. MARRON, APLC
RONALD A. MARRON (175650)
ron@consumersadvocates.com
SKYE RESENDES (278511)
skye@consumersadvocates.com
ALEXIS M. WOOD (270200)
alexis@consumersadvocates.com
651 Arroyo Drive
San Diego, CA 92103
Phone: (619) 696-9006
Fax: (619) 564-6665

Counsel for Plaintiffs and the Putative Class

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA

GARY REYNOLDS and ROBERT MASON, on behalf of themselves and others similarly situated,

Plaintiffs,

v.

WALGREEN CO.,

Defendant.

Case No: 15-cv-324

CLASS ACTION

COMPLAINT FOR VIOLATIONS OF CALIFORNIA AND ILLINOIS CONSUMER PROTECTION STATUTES

DEMAND FOR JURY TRIAL

Plaintiffs Gary Reynolds and Robert Mason, on behalf of themselves, all others similarly situated, and the general public, by and through their undersigned counsel, hereby bring this action against Walgreen Co. ("Walgreens"), and allege the following upon their own knowledge, or where they lack personal knowledge, upon information and belief, including the investigation of their counsel.

INTRODUCTION

1. Walgreens markets and sells a store-brand CoQ10 softgel dietary supplement called "Well at Walgreens Enhanced Absorption Formula CoQ-10" ("Well" or "Well CoQ10"). On its packaging, Walgreens prominently advertises and claims that Well CoQ10 is an "ENHANCED ABSORPTION FORMULA." A true and correct copy of Walgreens' Well CoQ10 packaging is attached hereto as Exhibit 1.

2. In order for a softgel dietary supplement to be absorbed after ingestion, it must first rupture then dissolve. The U.S. Pharmacopeial Convention (USP), an organization that promulgates and publishes testing standards in the drug and dietary supplement industries, has set a minimal threshold of rupture within 15 minutes, and 75% dissolution, for a supplement to exhibit reasonably effective bioavailability through absorption.[1]

3. Despite Walgreens' claim of "ENHANCED ABSORPTION," independent laboratory tests demonstrate that the Well CoQ10 softgels fail to timely rupture (in some cases, not even rupturing after an hour), and exhibit substantially less than the 75% dissolution that USP considers necessary in order to provide sufficient absorption for reasonably effective bioavailability. As a result, Walgreens' product claim of "ENHANCED ABSORPTION" is literally false or highly misleading.

4. Further, because Well CoQ10 fails to meet the USP-standard minimum 75% dissolution for effective absorption and bioavailability, Walgreens' additional product claims based on the alleged effectiveness of its softgels are also false or misleading, including for

[1] Bioavailability is the propensity of a substance to reach the systemic circulation, which decreases with incomplete absorption (by comparison, medicine intravenously injected is 100% bioavailable).

example Walgreens' representations that Well CoQ10 "may support heart health" and is "beneficial for those taking cholesterol-lowering stain drugs."

5. Plaintiffs bring this class action to remedy the damage caused to them and other consumers by Walgreens' false advertising and defective Well CoQ10 product.

JURISDICTION & VENUE

6. The Court has original jurisdiction pursuant to 28 U.S.C. § 1332(d)(2), the Class Action Fairness Act, because the matter in controversy exceeds the sum or value of $5,000,000 exclusive of interest and costs, and because more than two-thirds of the members of the class reside in states other than the states in which Walgreens is a citizen. The Court also has original jurisdiction pursuant to 28 U.S.C. § 1331 because this action raises a federal question under the Magnuson-Moss Warranty Act, 15 U.S.C. §§ 2301 *et seq.*

7. Venue is proper in this Court pursuant to 28 U.S.C. § 1391 because plaintiff resides in and suffered injuries as a result of Walgreens' acts in this district, many of the acts and transactions giving rise to this action occurred in this district, and Walgreens is authorized to conduct business in this district, does substantial business in this district, has intentionally availed itself of the laws and markets of this district, and is subject to personal jurisdiction in this district.

INTRADISTRICT ASSIGNMENT

8. Pursuant to N.D. Cal. Civ. L.R. 3-2(c) and as further set forth herein, this action arises in Alameda County in that a substantial part of the events and omissions which gave rise to the claims occurred in Alameda County. Accordingly, pursuant to N.D. Cal. Civ. L.R. 3-2(d), this action is properly assigned to either the San Francisco or Oakland Division.

PARTIES

9. Plaintiff Gary Reynolds is a resident of Oakland, California, in Alameda County.

10. Plaintiff Robert Mason is a resident of San Jacinto, California, in Riverside County.

11. Defendant Walgreen Co. is an Illinois corporation with its principal place of business at 180 Wilmot Rd., Deerfield, Illinois 60015.

FACTS

A. Coenzyme Q10

12. CoQ10 is a vitamin-like, anti-oxidant nutrient produced naturally in the heart, liver, kidneys, and pancreas. It plays a vital role in cellular energy production and is known to provide various benefits, especially to heart health. Although most commonly known in abbreviated form as CoQ10, it is more formally referred to as ubiquinone, ubidecarenone, or uniquinol, depending upon its form.

13. Generally, the body produces sufficient CoQ10, but blood levels can be depleted by aging, heart disease, and some medications, especially statins. For those wishing to replace depleted CoQ10 or otherwise increase blood levels to realize the substance's potential health benefits, dietary supplementation is common.

14. In order to provide a benefit, a nutrient must first be absorbed into the body's systemic circulation in an adequate amount. Thereafter, it is carried to various organs and tissues for eventual uptake by the cells. Accordingly, to realize any benefits of CoQ10 supplementation at a cellular level, an individual must achieve effective or optimum CoQ10 blood levels.

15. While CoQ10 can provide health benefits, it also has a well-known drawback: it is not soluble in water, and poorly soluble in fat. In its raw form, CoQ10 is a crystalline powder. It has been reported that the bioavailability of raw CoQ10 powder is less than 10%. This is problematic for consumers who use CoQ10 supplements because the body and digestive tract are aqueous, and the absorption of a substance depends on its first dissolving. To address this problem, some dietary supplement manufacturers have invented technologies for modifying orally-administered CoQ10 to increase its solubility, and thereby its bioavailability.

16. Accordingly, the formulation of a CoQ10 dietary supplement is crucial to its bioavailability. CoQ10 supplements have been available to consumers for approximately 20 years, but initial CoQ10 supplements offered on the market, which were little more than raw CoQ10 powder, were not well-absorbed because of CoQ10's hydrophobicity and large

molecular weight. It has long been known that the absorbability of CoQ10 can be increased when taken with food. The absorption of poor water-soluble drugs—that is fat soluble vitamins like CoQ10—is increased especially when administered with or after a meal containing fat, in part because fats stimulate bile salt secretion, which assists in drug and vitamin solubilization because bile salts are natural emulsifiers. However, taking such unsophisticated CoQ10 supplements with food does not, alone, significantly enhance absorption.

17. Consumers of CoQ10 supplements—who are familiar both with CoQ10's benefits, and its poor absorption—seek out technologies that purport to increase its absorbability. Thus, according to the Better Business Bureau's National Advertising Division, in December 2009, "several manufacturers currently advertise 'absorbability' as one of the features of their CoQ10 supplements."

18. Over the past several years, dietary supplement manufacturers have taken a variety of approaches to boosting the bioavailability of orally-administered CoQ10 supplements—some as simple as suspending CoQ10 powder in oil, others complex, patented processes—with varying degrees of success. Because the body is comprised far more of water than fat, in order to enhance the substance's dissolution, and thus absorbability, some companies seeking to enhance CoQ10 dissolution and hence absorption try to make the compound maximally water-soluble. Examples of different patented technologies employed in CoQ10 supplements include Bio-Solv and Hydro-Q-Sorb (Tishcon Corp.), Q-Sorb (Nature's Bounty), All-Q (DSM Nutritional Products Ltd.), and VESIsorb (SourceOne Global Partners, LLC).

19. CoQ10 has become one of the most popular supplements in the United States, with hundreds of different brands on the market, and sales in 2011 of over $500 million.

B. The United States Pharmacopeial Convention

20. USP is a nonprofit scientific organization founded in 1820 in Washington, D.C., whose participants, working under strict conflict-of-interest rules, and using careful scientific method and consensus, set enforceable standards for the quality of drugs, and voluntary

standards for the quality of vitamins and dietary supplements. Known as Reference Standards, these are updated and published annually by USP and the National Formulary in a compendia called the USP-NF, which consists of Monographs, General Chapters, and General Notices. Monographs include the name of an ingredient or preparation; its definition; its packaging, storage, and labeling requirements; and its specification (i.e., a series of tests, procedures for the tests, and acceptance criteria that require use of the official USP Reference Standards). General Chapters set forth tests and procedures referred to in multiple monographs. And General Notices provide definitions for terms used in monographs, as well as information necessary to interpret monograph requirements.

21. Although compliance with USP's standards concerning dietary supplements is not required by regulation, USP plays a major role in the multi-billion dollar dietary supplement industry, providing the objective (and only) scientifically-valid industry standards against which all supplements may be tested and measured, providing important information about a supplement's intrinsic qualities, and serving as a "level playing field" for comparing two or more products.

22. Compliance with an applicable USP monograph means a tested product contains the ingredients listed in the declared amount and potency, and will break down and release into the body within a specified amount of time. Thus, whether or not required by regulation, the testing and measurement of a dietary supplement by the prescribed USP methodologies and standards provides an objective idea of whether the supplement is likely to be effective when taken orally by a human.

23. The type of information that results from USP testing is important to consumers in determining the relative quality (and value) of competing dietary supplements. For example, in a product review of joint health supplements for pets and animals containing glucosamine, chondroitin, and MSM, ConsumerLab.com, a well-respect consumer watchdog organization that does comparative testing, noted that certain formulations "were analyzed for disintegration utilizing [USP] <2040> recommendations," and to obtain a "Pass," a

product must "meet recommended USP <2040> parameters for disintegration for dietary supplements[.]"

24. In the case of CoQ10 softgels, the USP tests for rupture and dissolution show whether a product is likely to break up early enough in the digestive process to provide an effective amount of the enclosed CoQ10, and, if the product does timely rupture, whether the supplement is likely to adequately dissolve so as to provide reasonable bioavailability. Moreover, USP distinguishes between water-soluble CoQ10 forms (which are commonly known in the industry and to consumers as "enhanced absorption" formulas), and other, non-water-soluble forms (commonly known in the industry and to consumers as "regular" formulas).

25. The process of digesting a CoQ10 softgel supplement begins with the timely rupture, or break up, of the gelatin outer shell. This is a necessary prerequisite to absorption because a pill that does not timely rupture will pass through the gastrointestinal tract without dissolution and then absorption commencing as quickly, or at all. Digestion is a relatively quick process, and in some cases, a softgel may *never* rupture. A person consuming such a capsule would pass it without digesting or absorbing any of its contents, realizing *none* of the product's potential benefits or value.

26. Even if a CoQ10 softgel ruptures, it must adequately dissolve, because dissolution is the first step in, and a prerequisite to, the absorption of a supplement. Thus, information about a supplement's dissolution rate is important information corresponding to the relative effectiveness of a supplement that is orally ingested.

27. A true and correct copy of the USP Monograph for CoQ10, designated "Ubidecarenone Capsules" ("USP CoQ10 Monograph"), is attached hereto as Exhibit 2, and expressly incorporated into this Complaint.

28. As can be seen in Exhibit 2, the USP CoQ10 Monograph prescribes a maximum time-to-rupture of 15 minutes, and a minimum dissolution rate of 75% for CoQ10 softgels to achieve reasonably effective absorption and hence bioavailability.

29. More specifically, the USP CoQ10 Monograph prescribes the following "Performance Tests": "**Disintegration and Dissolution <2040>:** Meet the requirements of the test for *Disintegration*, except where the product is labeled to contain a water-soluble form of ubidecarenone. Capsules labeled to contain a water-soluble form of ubidecarenone meet the requirements for *Dissolution* as follows."[2] The Monograph then sets forth a procedure and method of calculation, and requires that "NLT [Not Less Than] 75% of the labeled amount of ubidecarenone . . . dissolve[s]."

30. The tests for *Disintegration* (sometimes called Rupture) and *Dissolution* (sometimes called solubilization) are set forth in the USP-NF General Chapter on Disintegration and Dissolution of Dietary Supplements, USP-NF General Chapter <2040>, a true and correct copy of which is attached hereto as Exhibit 3, and expressly incorporated into this Complaint.

31. Although Chapter <2040> includes sections on both *Disintegration* and *Dissolution*, the specific dissolution procedure set forth in the USP CoQ10 Monograph supplements or replaces the dissolution section in Chapter <2040>.

32. As can be seen in Exhibit 3, for *Disintegration*, Chapter <2040> requires "Soft Shell Capsules," like the Well CoQ10 softgels, to "[p]roceed as directed under *Rupture Test for Soft Shell Capsules*," which in turn requires rupture "in not more than 15 minutes."

C. Walgreens' Well CoQ10

33. Walgreens sells at least two versions of Well CoQ10, namely 100mg and 200mg versions (each which contains 50 softgels), for approximately $31 and $42, respectively.

34. Walgreens purchases the Well CoQ10 softgels from a Rhode Island supplier, Lang Pharma Nutrition, Inc. ("Lang").

35. Lang also supplies CoQ10 softgels identical to those in Walgreens' Well CoQ10 product to at least two other retailers, namely to CVS, which sells its Lang-supplied CoQ10

[2] The USP CoQ10 Monograph requires that, "[w]here the product contains a water-soluble form of ubidecarenone, this is so stated on the label."

softgels under CVS's store brand "CVS/pharmacy Ultra CoQ10," and to Wal-Mart, which sells its Lang-supplied CoQ10 softgels under Wal-Mart's store brand "Equate High Absorption Co Q-10."

36. These identical private-label CoQ10 softgel products as supplied by Lang to Walgreens, CVS, and Wal-Mart all employ a patented technology called VESIsorb, invented by a Swiss company, Vesifact, AG, and owned by SourceOne Global Partners LLC ("SourceOne"), a Chicago company that licenses the VESIsorb patented technology to Lang. These identical softgels used for all three products are sometimes referred to herein as the "VESIsorb CoQ10 softgels."

37. Lang outsources manufacturing of the VESIsorb CoQ10 softgels to a company in Florida called Swiss Caps USA, Inc. ("Swiss Caps"). Lang sends Swiss Caps raw CoQ10 powder and raw VESIsorb "paste." Swiss Caps then mixes the two and encapsulates the resulting "medicine" (as Swiss Caps calls it) into a gelatin softgel. Swiss Caps ships the completed softgels to a New Jersey packaging company, which packages them for Lang (for example, in either Walgreens Well, CVS Ultra, or Wal-Mart Equate packaging). Lang then distributes the packaged VESISorb CoQ10 softgels to its retailer customers, shelf-ready for sale to consumers.

38. The VESIsorb technology is described in U.S. Patent No. 8,158,134, a true and correct copy of which is attached hereto as Exhibit 4, and expressly incorporated into the Complaint; and German Patent No. EP1249230B1, a true and correct copy of which is attached hereto as Exhibit 5, and expressly incorporated into the Complaint.

39. VESIsorb's U.S. patent states that the "invention relates to compositions in the form of microemulsion preconcentrates," which, "[w]hen contacted with water or with an aqueous medium . . . form microemulsions," which themselves, when "[i]n the aqueous phase, . . . may contain water-soluble substances." (Ex. 4.)

40. SourceOne's website for VESIsorb quotes a Dr. Andrew Halpner as saying of VESIsorb, that its "ability to offer bio-enhanced, water-soluble ingredients such as CoQ10 . . . to dietary supplement, functional food and beverage markets, has set a new benchmark for

the industry."[3] On the same webpage, SourceOne depicts a product called "Pure encapsulations Ubiquinol VESIsorb." A brochure for the product states that the VESIsorb technology "increases bioavailability of a bioactive that is fat soluble or that has poor water solubility," by creating "[n]anosized water-soluble droplets" that "allow the bioactive to cross the water layer of the GI tract for absorption."

41. In an effort to prove its technology, Vesifact commissioned a study to compare the bioavailability of CoQ10 capsules made with VESIsorb to other commercially-available CoQ10 supplements. The results were reported in the March-April 2009 issue of Alternative Therapies in Health & Medicine, in an article titled *Relative Bioavailability Comparison of Different Coenzyme Q10 Formulations with a Novel Delivery System*,[4] a true and correct copy of which is attached hereto as Exhibit 6, and expressly incorporated into this Complaint.

42. *Relative Bioavailability* describes the VESIsorb "delivery system" as "a lipid-based formulation that self-assembles on contact with an aqueous phase into a colloidal delivery system," which it says is an example of "enhancement of the rate and extent of dissolution," rather than "facilitation of an absorption process."

43. All of the VESIsorb CoQ10 softgels supplied by Lang to Walgreens, CVS, and Wal-Mart are water-soluble formulations. But despite that Walgreens' Well CoQ10 softgels are based on the same VESIsorb technology that purports to make the CoQ10 contained therein water-soluble, and thus contain a water-soluble form of ubidecarenone, Walgreens does not state on Well CoQ10's packaging that the product is a water-soluble formulation. Nevertheless, Walgreens' does state on the packaging that the product is an "ENHANCED ABSORPTION FORMULA," which, as noted above, is commonly understood in the marketplace as meaning a water-soluble formula. (See Ex. 1).

---

[3] *See*, "Products Offered / VESIsorb Delivery System," at http://source-1-global.com/products-offered/vesisorb-delivery-system (last visited December 15, 2014).

[4] Z. Xia-Lui et al., *Relative Bioavailability Comparison of Different Coenzyme Q10 Formulations with a Novel Delivery System*, Alternative Therapies in Health & Medicine 15(2) 2009, 42-46.

44. In addition to prominently advertising and claiming that Well CoQ10 provides "ENHANCED ABSORPTION," Walgreens also represents on the packaging (see Ex. 1) that the product provides several health benefits, such as the following:

- "May support heart health"
- "May help support heart, vascular health & healthy blood pressure levels"
- "Beneficial for those taking cholesterol-lowering statin drugs"
- "Beneficial to statin drug users"
- "Important for energy production"

45. Based on USP standards, in order for Walgreens' Well CoQ10 softgels to be reasonably effective, the softgels must rupture within 15 minutes, and achieve no less than 75% dissolution.

D. Independent Laboratory Testing

46. The Lang-supplied VESIsorb CoQ10 softgels that Walgreens sells as Well CoQ10 have been subject to numerous independent laboratory tests in 2013 and 2014, including by both plaintiff and Lang. Several tests show USP failures.

1. Eurofins Testing (January 2015)

From about December 24, 2014 to January 21, 2015, Eurofins Scientific, Inc.'s Supplement Analysis Center in Petaluma, California tested: (a) a sample of CVS Ultra CoQ10 100mg softgels, from Lot J13NM22, bearing an expiration date of September 2015, which was purchased on December 22, 2014 from the CVS located at 4829 Clairemont Drive, San Diego, California 92117; and (b) a sample of CVS Ultra CoQ10 100mg softgels, from Lot C14NM50, bearing an expiration date of February 2016, which was also purchased on December 22, 2014 from the CVS located at 4829 Clairemont Drive, San Diego, California 92117. The samples were provided to Eurofins blindly, in sealed bottles whose labels were completely obscured. Eurofins tested both samples for rupture and dissolution according to the methods prescribed by USP. Eurofins' testing showed that the first CVS Ultra CoQ10 sample achieved 1% dissolution and did not rupture after 60 minutes; and, with the addition of pepsin, achieved 3.2% dissolution, but still did not rupture after 60 minutes. Eurofins'

testing also showed that the second CVS Ultra CoQ10 lot 3.8% dissolution, and did not rupture after 60 minutes; and, with the addition of pepsin, achieved 74.2% dissolution, but took 51 minutes to rupture. A true and correct copy of the January 21, 2015 Eurofins Certificates of Analysis for Ultra CoQ10 Lots J13NM22 and C14NM50 are attached hereto as Exhibit 7.

2. Eurofins Testing (December 2014)

47. From about December 2 to 10, 2014, Eurofins Scientific, Inc.'s Supplement Analysis Center in Petaluma, California tested: (a) a sample of Well CoQ10 100mg softgels, from Lot E14NM12, bearing an expiration date of February 2016, which was purchased on November 19, 2014 from the Walgreens located at 301 University Avenue, San Diego, California 92103; and (b) a sample of Well CoQ10 200mg softgels, from Lot E14NM20, bearing an expiration date of March 2016, which was also purchased on November 19, 2014 from the Walgreens located at 301 University Avenue, San Diego, California 92103. The samples were provided to Eurofins blindly, in sealed bottles whose labels were completely obscured. Eurofins tested both samples for rupture and dissolution according to the methods prescribed by USP. Eurofins' testing showed that the 100mg Well CoQ10 softgels did not rupture after more than 60 minutes in water, and took 49 minutes to rupture during a retest using pepsin, an enzyme that breaks down proteins and promotes solubilization. Eurofins testing also showed the 100mg Well CoQ10 sample achieved just 2.21% dissolution in water, and 75.4% dissolution during a retest using pepsin. Similarly, Eurofins' testing showed the 200mg Well CoQ10 sample took 58 minutes to rupture in water, and 35 minutes to rupture during a retest using pepsin. Eurofins' testing also showed the 200mg Well CoQ10 sample achieved just 28.9% dissolution in water (61.2 mg/softgel ÷ 212 mg/softgel based on a corresponding strength test, which shows the amount of CoQ10 actually in a sample and often varies from the labeled amount), and 87.7% dissolution during a retest using pepsin. A true and correct copy of the December 10, 2014 Eurofins Certificates of Analysis for Well CoQ10 Lots E14NM12 and E14NM20 are attached hereto as Exhibit 8.

3. Eurofins Testing (July 2014)

48. From about July 7 to 21, 2014, Eurofins Scientific, Inc.'s Supplement Analysis Center in Petaluma, California tested a sample of Wal-Mart's Equate CoQ10 softgels, from Lot G13NM13, bearing an expiration date of March 2015, which was purchased on August 15, 2013 from the Wal-Mart located at 4840 Shawline St., San Diego, California 92111. From August 2013 to July 2014, the sample was maintained, sealed in the bottle, in its outer cardboard packaging, inside a file cabinet, in an office whose temperature was generally maintained between 69 and 74 degrees Fahrenheit. The Equate sample was provided to Eurofins blindly, in a sealed bottle whose label was completely obscured. Eurofins tested the sample for rupture and dissolution according to the methods prescribed by USP. Eurofins testing shows Equate failed to rupture after more than 60 minutes in water, and took 47 minutes to rupture during a retest using pepsin. The Eurofins testing also shows the Equate sample achieved less than 2% dissolution in water, and 47% dissolution on a retest using pepsin (e.g., 45.3 mg/softgel ÷ 96.3 mg/softgel). A true and correct copy of the July 21, 2014 Eurofins Certificate of Analysis for Equate Lot G13NM13 is attached hereto as Exhibit 9.

4. Advanced Botanical Testing (February 2014)

49. On August 8, 2012, Advanced Botanical Consulting & Testing, Inc. received from Lang a sample of CVS Ultra softgels (e.g., the same VESIsorb CoQ10 softgels as Equate) for a long-term stability study. The sample was identified as "Lot #: F12NM10." At 18 months, in February 2014, Advanced Botanical tested Equate's "Rupture (USP)." The results: "Fail, >30 min." Advanced Botanical had not previously tested for rupture since receiving the sample in August 2012. A true and correct copy of the Advanced Botanical testing report, dated February 18, 2014, is attached hereto as Exhibit 10.

5. Tampa Bay Analytical Research Testing (November 2013)

50. On November 18, 2013, Tampa Bay Analytical Research, Inc. (TBAR) tested samples from two different lots of CVS Ultra CoQ10, Lots F12NM09 and F12NM10, which are the identical Lang-supplied VESIsorb CoQ10 softgels as in Equate. The samples were purchased on June 9, 2013 (Lot F12NM09), and August 15, 2013 (Lot F12NM10), from the

CVS/pharmacy store located at 4829 Clairemont Drive, San Diego, California, 92117. From June and August 2013, respectively, until early November 2013, the samples were maintained, sealed in the bottles, in their outer cardboard packaging, in an office whose temperature is generally maintained between 69 and 74 degrees Fahrenheit. The samples were provided to TBAR blindly, in sealed bottles whose labels were completely obscured. For each lot, TBAR analyzed 6 capsules, following USP protocols for testing rupture and dissolution. TBAR's testing showed that 7 out of 12 of the soft gel capsules tested did not rupture at all, even after 60 minutes; 3 out of the 12 experienced at best an immaterial, *de minimis* leakage of contents, perhaps from a pinhole-size opening, but no discernable, visible rupture was observed, even after 60 minutes; and only 2 softgel capsules (1 from each lot) actually ruptured, but only after approximately 50 minutes. The 2 capsules that ruptured showed only 27.6%, and 27.9% dissolution. A true and correct copy of TBAR's two testing reports, each an "Assay Result Form," is attached hereto as Exhibit 11.

6. Advanced Botanical Testing (September 2013)

51. Between September 6, 2013 and September 10, 2013, Advanced Botanical performed USP dissolution testing for Lang on a sample identified as "CoQ10 w/ VesiSorb," and identified as "Item#: C13NM29," with an expiration date of January 2015. This corresponds to Equate CoQ10 that was available for purchase in around June 2013, for example, in the Wal-Mart located at 4840 Shawline St., San Diego, California 92111. Using the standard USP procedure, Advanced Botanical's testing showed Equate achieved only 39% dissolution. The report describes the reason for the poor dissolution:

> CoQ10 in the softgels once ruptured was physically suspended in the dissolution medium, not chemically solublized. If the solution is directly filtered and injected, the unsolublized portion is removed by the filtration step, which lead to low result. The dissolution sample needs to be properly diluted with organic solvent like isopropyl alcohol to assure complete solublization of the CoQ10, prior to injection into the HPLC.

The USP methods and procedures applicable to CoQ10 do not permit the use of isopropyl alcohol to enhance CoQ10 dissolution. A true and correct copy of Advanced Botanical's September 10, 2013 testing report as described above is attached hereto as Exhibit 12.

7. Covance Testing (August 2013)

52. Between August 2 and 12, 2013, Covance Laboratories analyzed samples from two different lots of Equate. Following USP procedures, for each lot Covance measured six softgels, determining that one lot offered an average of 41.18% dissolution, and the second, and average of 41.3% dissolution. A true and correct copy of the Covance Laboratories Certificates of Analysis relating to this testing (one per lot) are attached hereto as Exhibit 13.

* * *

53. The preceding testing results concerning rupture and dissolution are summarized in the following table:

Test	Eurofins (Well 100mg) (12/14)	Eurofins (Well 200mg) (12/14)	Eurofins (1/15)	Eurofins (1/15)	Eurofins (7/14)	ABC (2/14)	TBAR (11/13)	ABC (9/13)	Covance (8/13)
Disintegration (Rupture)	> 60 min (49 min w/ pepsin retest)	58 min (35 min w/ pepsin retest)	>60 min (>60 min w/ pepsin retest)	>60 min (51 min w/ pepsin retest)	> 60 min (47 min w/ pepsin retest)	> 30 min	> 60 min (10 capsules) 50 min (2 capsules)	-	-
Dissolution	2.21% (75.4% w/ pepsin retest)	28.9% (87.7% w/ pepsin retest)	1% (3.2% w/ pepsin retest)	3.8% (74.2% w/ pepsin retest)	< 2% (45.3% w/ pepsin retest)	-	27.75% (avg)	39%	41.24% (avg)

WALGREENS' DECEPTIVE ACTS & UNFAIR BUSINESS PRACTICES

A. Walgreens Sells Defective Well CoQ10 Dietary Supplements

54. Well CoQ10 fails to rupture within 15 minutes, instead taking at least 35, and at times more than 60 minutes to rupture. These results are consistent with the rupture of identical VESISorb CoQ10 softgels used in CVS Ultra and Wal-Mart Equate CoQ10 supplements. By its failure to rupture, Well CoQ10 provides consumers with little or no benefit, making them ineffective, and indeed defective.

55. But even if Well CoQ10 timely ruptures, it fails to adequately dissolve as shown by its direct testing and the testing of identical VESISorb CoQ10 softgels, frequently exhibiting less than 50% dissolution (and at times less than 2%), well below the USP standard of 75%, further providing little or no benefit to consumers, also rendering the product defective.

56. CoQ10 supplements manufactured in full compliance with Good Manufacturing Practices, and exercising adequate quality control, will measure far more consistently than do the VESIsorb CoQ10 softgels used in Well CoQ10 across batches and lots, and over time (e.g., without degradation during the product's lifetime preceding its expiration date). The wide divergence in the VESIsorb CoQ10 softgels' dissolution results—less than 2%, 28%, 39%, 41%, 45%, etc.—suggest some defect in its formulation, manufacturing (including possibly relating to its outer softgel gelatin coating), packaging, or distribution resulting in inconsistent batches of Well CoQ10, many of which provide the consumer little or no effect, and which may degrade quickly during the product's shelf life.

B. Walgreen's Claim of "Enhanced Absorption" is False & Misleading

57. Walgreen's claim of "Enhanced Absorption" is based on the *Relative Bioavailability* study. On Well's packaging, however, Walgreens deceptively omits the source of these claims, providing consumers with no means of investigating the claim's *bona fides*. Nevertheless, *Relative Bioavailability* does not establish Walgreens' claim.

58. First, *Relative Bioavailability's* small sample size (just 20 subjects) allows for distortion by random chance, and magnifies bias. This is especially true because the human body is a complex environment. Thus, the results cannot possibly be considered reliable.

59. Second, *Relative Bioavailability* employed improper exclusion criteria. Well CoQ10's packaging advertises it is "Beneficial to statin drug users," but *Relative Bioavailability* excluded as test subjects those taking "Medication affecting cholesterol (eg, statins)." CoQ10 is often taken by those with heart conditions seeking to improve and promote heart health, and the Well package states it "May support hearth health," but *Relative Bioavailability* excluded subjects with heart conditions. And while CoQ10 supplements are most popular with those over 55, *Relative Bioavailability* excluded subjects over 60, and did not state the age of the subjects chosen. The exclusion of test subjects with certain conditions and characteristics undermines the study's reliability in predicting the "real world" absorption claimed by Walgreens on Well CoQ10's label.

60. Moreover, *Relative Bioavailability* represents only limited initial results with no verification of clinical response. The article concludes that "[a]dditional clinical studies are indicated to verify that the improved absorption with [VESIsorb] correlated with clinical response to treatment." Thus, by its own admission, the *Relative Bioavailability* study does not actually "verify" anything, and certainly not any "clinical response" to VESIsorb CoQ10 softgels, especially when extrapolated to the general population.

61. *Relative Bioavailability* is also undermined by bias and sponsorship, and cannot be considered independent. Besides Vesifact supplying the VESIsorb capsules for use in the study, "[t]he work was funded by Vesifact AG, Baar, Switzerland." And one of the two authors of the study, Carl Artmann, "served as paid consultant[ ] to Vesifact in monitoring and analyzing this study . . . ." The other author, Zheng-Xian Liu, "served as a paid consultant to SourceOne Global Partners in the preparation of th[e] manuscript . . . ." Despite stating that both authors of the study hold "no other financial interest in the products or technologies studied or in either Vesifact or SourceOne," the study's having been funded by and conducted on behalf of companies that in fact have a significant financial interest in its outcome

undermines the study's credibility and reliability. And at the time Dr. Liu was paid by SourceOne to prepare the *Relative Bioavailability* manuscript, he had an ongoing relationship with, and was being compensated as a consultant on several different projects for SourceOne.

62. But even if *Relative Bioavailability* supported the conclusion that the VESIsorb capsules tested in Germany in 2008—likely fresh samples, carefully-manufactured by someone other than Swiss Caps, provided directly to the study's administrators by Vesifact—exhibited increased absorption, this does not support *Walgreens'* claim that *Well CoQ10*, as formulated, mass-manufactured, and distributed in the United States and available on retail shelves to consumers, offers equivalent "enhanced absorption."

63. To the contrary, a substantial body of testing based on USP protocols and standards shows Well CoQ10, and the same VESIsorb CoQ10 softgels, frequently fails to timely rupture or rupture at all, offering consumers little or no efficacy, and inadequately dissolves, making little CoQ10 even available for absorption and bioavailability.

64. This is especially significant because *Relative Bioavailability* discusses the importance of water solubility, and the technology purportedly employed in Well CoQ10 claims to enhance the water solubility of CoQ10, yet the USP test designed by independent scientists to determine whether a CoQ10 supplement is water soluble—the special dissolution test prescribed in the USP CoQ10 Monograph requiring 75% dissolution to pass—shows the VESIsorb CoQ10 softgels used in Well CoQ10 not only consistently fail dissolution, but sometimes fail miserably, with as little as 1% dissolution.

65. For example, *Relative Bioavailability* explains that bile salts "enhance drug solubilization" because they help form "micelles" that "transport the lipophilic molecules though the aqueous environment of the gastrointestinal (GI) tract and across the unstirred water layer to the absorptive epithelium," and that VESIsorb supposedly "mimics this natural absorption process to improve bioavailability of poorly water-soluble drugs" like CoQ10.

66. As *Relative Bioavailability* notes, "[t]he absorption of most drugs depends on 2 processes: (1) the dissolution of the drug in physiological fluids and (2) the absoprtion process itself (ie, the process by which a drug in solution enters the cells at the absorption site and

finally enters general blood circulation).") Thus in sum, "the dissolution of [a] drug is the first step in the absorption process . . . ." For poorly-absorbed drugs like CoQ10, one technique used to "increase the extent to which the administered drug is absorbed" is "enhancement of the rate and extent of dissolution," with VESIsorb an "example of the . . . technique."

67. *Relative Bioavailability* also notes that "VESIsorb was designed to address the poor bioavailability of . . . natural bioactives like CoQ10 exhibiting poor water solubility," by using a process in which the "bioactive will be solubilized . . . ."

68. If *Relative Bioavailability* requires water solubility in order for a CoQ10 supplement using VESIsorb technology to properly function, and industry standard testing based on scientifically-sound principles developed by an independent expert organization demonstrates Well CoQ10 is not water soluble, then by definition *Relative Bioavailability* cannot support Well's claims of "Enhanced Absorption" (even if, *arguendo*, the study might otherwise support the claim for a VESIsorb-based CoQ10 supplement that practiced the patented technology correctly and was free from any formulation, manufacturing, or handling errors or defects).

69. Walgreens also deceptively omits the products, by comparison, over which Well CoQ10 supposedly offers "Enhanced Absorption." If Walgreens uses the claim to compare Well CoQ10 to *all* or *any given* solubilized CoQ10 dietary supplement in the market, this is false: even *Relative Bioavailability* only compared the VESIsorb product to three others, and no other clinical studies comparing any other products to competing CoQ10 supplements—much less any studies comparing them to Well, itself—have been conducted. But if Walgreens intends the "Enhanced Absorption" claim to make a comparison to regular, unsolubilized CoQ10, this is also false because Well CoQ10 fails the USP dissolution test just as any such "regular," unsolubilized CoQ10 supplement inevitably will.

C. Walgreens' Benefit Claims Are False & Misleading

70. While Walgreens' benefit claims (like "May help support heart health" and "May help support heart, vascular health & healthy blood pressure levels") may be literally true since CoQ10 *can* offer such benefits if supplements are carefully formulated, manufactured, and handled, defects in Well CoQ10's formulation, manufacturing, or distribution chain resulting in CoQ10 softgels with suboptimal dissolution, render the statements as used on Well misleading, especially in combination with the "Enhanced Absorption" efficacy claim.

PLAINTIFFS' PURCHASES, RELIANCE, AND INJURY

71. On several occasions within approximately the last year, plaintiff Gary Reynolds purchased approximately 3 or 4 bottles of Well CoQ10 from the Walgreens located at 5055 Telegraph Avenue, in Oakland, California. In purchasing Well CoQ10, Mr. Reynolds relied on Walgreens' representation that Well CoQ10 offers "Enhanced Absorption," or is an "Enhanced Absorption Formula," as well as its various health claims, such as Walgreens' representations that Well "May support heart health," "May help support heart, vascular health & healthy blood pressure levels," and is "Important for energy production."

72. On approximately three occasions over the last six months, plaintiff Robert Mason purchased Well CoQ10 from the Walgreens located at 1661 West Florida Avenue, in Hemet, California. In purchasing Well CoQ10, Mr. Mason relied on Walgreens' representation that Well CoQ10 offers "Enhanced Absorption," or is an "Enhanced Absorption Formula," as well as its various health claims, such as Walgreens' representations that Well "May support heart health," "May help support heart, vascular health & healthy blood pressure levels," is "Beneficial to statin drug users," and is "Important for energy production."

73. For their Well CoQ10 purchases, plaintiffs relied on Walgreens' representation that Well provides "Enhanced Absorption," and that it generally supports heart health, but these claims were false and misleading for the reasons described herein.

74. Because it frequently fails even to rupture, Well CoQ10 is actually ineffective, so plaintiffs did not receive what they paid for, and lost money in the full amount of their Well CoQ10 purchases. Even where Well CoQ10 ruptures, because it fails to adequately dissolve, Well CoQ10 is actually only partially effective, so plaintiffs did not receive what they paid for, and lost money in amount of their Well CoQ10 purchases or some portion thereof.

75. Plaintiffs purchased Well CoQ10 instead of competing products based on the false statements and misrepresentations described herein.

76. Well CoQ10 was unsatisfactory to plaintiffs because it did not provide the full benefit advertised, and may have provided no benefit.

77. Plaintiffs would not have purchased Well CoQ10 absent Walgreens' misleading claims, or would not have paid the price they did for Well if they knew that Well does not timely rupture, does not dissolve at all or to any substantial degree (and certainly far less than the industry standard as reflected in the USP CoQ10 Monograph), and does not provide "Enhanced Absorption" over other brands they may have otherwise purchased.

78. Plaintiffs would not have paid the price they did for Well CoQ10, and may not have been willing to purchase Well at all, if they knew that it fails to timely rupture and provides substantially less dissolution than the USP CoQ10 Monograph specifies.

79. Plaintiffs paid a price premium due to Walgreens' fraudulent conduct, in that Walgreens was able to command a higher price in the marketplace for Well CoQ10 than it otherwise could have absent its false and misleading claims.

CLASS ACTION ALLEGATIONS

80. Pursuant to Rule 23, plaintiffs seek to represent a nationwide class comprised of all persons in the United States who purchased Well CoQ10 primarily for personal, family, or household use, and not for resale, and a California subclass comprised of all persons in California who purchased Well CoQ10 primarily for personal, family, or household use, and not for resale.

81. The members in the proposed class and subclass are so numerous that individual joinder of all members is impracticable, and the disposition of the claims of all class members in a single action will provide substantial benefits to the parties and Court.

82. Questions of law and fact common to plaintiff and the class include:

A. Whether Well CoQ10 fails to timely rupture, or rupture at all, and whether it exhibits at least 75% dissolution or otherwise exhibits sufficient dissolution for effective absorption;

B. Whether Walgreens made statements concerning Well CoQ10's absorption or benefits that were likely to deceive the public or consumers acting reasonably;

C. Whether Walgreens made any statement it knew or should have known was false or misleading;

D. Whether any of Walgreens' practices were immoral, unethical, unscrupulous, or substantially injurious to consumers;

E. Whether the utility of any of Walgreens' practices, if any, outweighed the gravity of the harm to its victims;

F. Whether Walgreens' conduct violated public policy, including as declared by specific constitutional, statutory or regulatory provisions;

G. Whether the consumer injury caused by Walgreens' conduct was substantial, not outweighed by benefits to consumers or competition, and not one consumers themselves could reasonably have avoided;

H. Whether Walgreens' behavior as alleged herein constitutes an unfair method of competition or unfair or deceptive act or practice within the meaning of the Illinois Consumer Fraud and Deceptive Business Practices Act, 815 ILCS § 505/2;

I. Whether Walgreens' policies, acts, and practices with respect to Well CoQ10 were designed to, and did result in the purchase and use of Well by the class members primarily for personal, family, or household purposes;

J. Whether Walgreens misrepresented the source, sponsorship, approval, or certification of Well CoQ10 within the meaning of 815 ILCS § 510/2(a)(2) or Cal. Civ. Code § 1770(a)(2);

K. Whether Walgreens represented that Well CoQ10 has characteristics, uses, or benefits which it does not have, within the meaning of 815 ILCS § 510/2(a)(5) or Cal. Civ. Code § 1770(a)(5);

L. Whether Walgreens represented that Well CoQ10 is original or new if it has deteriorated unreasonably or is altered, within the meaning of 815 ILCS § 510/2(a)(6) or Cal. Civ. Code § 1770(a)(6);

M. Whether Walgreens represented Well CoQ10 is of a particular standard, quality, or grade, when it was really of another, within the meaning of 815 ILCS § 510/2(a)(7) or Cal. Civ. Code § 1770(a)(7);

N. Whether Walgreens advertised Well CoQ10 with the intent not to sell it as advertised, within the meaning of 815 ILCS § 510/2(a)(9) or Cal. Civ. Code § 1770(a)(9);

O. Whether Walgreens represented that Well CoQ10 has been supplied in accordance with a previous representation when it has not, within the meaning of Cal. Civ. Code § 1770(a)(16);

P. Whether Well CoQ10 is a consumer product, whether the class members are consumers, and whether Walgreens is a supplier and warrantor, within the meaning of the Magnuson-Moss Warranty Act, 15 U.S.C. § 2301;

Q. Whether through Well CoQ10's packaging claims, Walgreens made express or implied warranties to purchasers;

R. Whether Walgreens breached express warranties by failing to provide Well CoQ10 in conformance with promises or descriptions that became a basis for the bargain;

S. Whether Walgreens breached implied warranties by failing to provide merchantable goods in selling Well CoQ10 to the class members, or by selling Well CoQ10 that was not fit for its particular purpose of supplementing the body's natural CoQ10 production sufficiently to support heart health;

T. Whether Walgreens' conduct or any of its acts or practices violated the Magnuson-Moss Warranty Act, 15 U.S.C. §§ 2103 *et seq.*, the Lanham Act, 15 U.S.C. §§ 1051 *et seq.*, the Consumer Fraud and Deceptive Business Practices Act, 815 ILCS §§ 505/1, *et seq.*, the Illinois Uniform Deceptive Trade Practices Act, 815 ILCS §§ 510/1, *et seq.*, the California False Advertising Law, Cal. Bus. & Prof. Code §§ 17500 *et seq.*, the

California Consumers Legal Remedies Act, Cal. Civ. Code §§ 1750 *et seq.*; or any other law;

U. The proper equitable and injunctive relief;

V. The proper amount of actual or compensatory damages;

W. The proper amount of restitution or disgorgement;

X. The proper amount of actual and punitive damages; and

Y. The proper amount of reasonable litigation expenses and attorneys' fees.

83. Plaintiffs' claims are typical of class members' claims in that they are based on the same underlying facts, events, and circumstances relating to Walgreens' conduct.

84. Plaintiffs will fairly and adequately represent and protect the interests of the class, have no interests incompatible with the interests of the class, and have retained counsel competent and experienced in class action litigation.

85. The class is sufficiently numerous, as both the class and subclass contain at least thousands of members who purchased the Walgreens Well CoQ10 at issue in this action.

86. Class treatment is superior to other options for resolution of the controversy because the relief sought for each class member is small such that, absent representative litigation, it would be infeasible for class members to redress the wrongs done to them.

87. Questions of law and fact common to the class predominate over any questions affecting only individual class members.

88. As a result of the foregoing, class treatment is appropriate under Fed. R. Civ. P. 23(a), (b)(2), and (b)(3).

FIRST CAUSE OF ACTION

VIOLATIONS OF THE CALIFORNIA FALSE ADVERTISING LAW, CAL. BUS. & PROF. CODE §§ 17500 *ET SEQ.*

(By the California Subclass)

89. Plaintiffs reallege and incorporate the allegations elsewhere in the Complaint as if fully set forth herein.

90. The FAL prohibits any statement in connection with the sale of goods "which is untrue or misleading," Cal. Bus. & Prof. Code § 17500.

91. Walgreens' claim that Well CoQ10 provides "Enhanced Absorption," and that it generally supports heart health and benefits statin users, is untrue or misleading in that Well CoQ10 does not timely rupture or sufficiently dissolve for effectiveness.

92. Walgreens knew, or reasonably should have known, that the claims were untrue or misleading.

93. Plaintiffs and members of the California subclass are entitled to injunctive and equitable relief, and restitution in the amount they spent on the Well CoQ10.

SECOND CAUSE OF ACTION

VIOLATIONS OF THE CALIFORNIA CONSUMERS LEGAL REMEDIES ACT, CAL. CIV. CODE §§ 1750 *ET SEQ.*

(By the California Subclass)

94. Plaintiff realleges and incorporates the allegations elsewhere in the Complaint as if fully set forth herein.

95. The CLRA prohibits deceptive practices in connection with the conduct of a business that provides goods, property, or services primarily for personal, family, or household purposes.

96. Walgreens' policies, acts, and practices were designed to, and did, result in the purchase and use of the products primarily for personal, family, or household purposes, and violated and continue to violate the following sections of the CLRA:

a. § 1770(a)(2): misrepresenting the source, sponsorship, approval, or certification of goods or services;

b. § 1770(a)(3): misrepresenting the affiliation, connection, or association with, or certification by, another;

c. § 1770(a)(5): representing that goods have characteristics, uses, or benefits which they do not have;

d. § 1770(a)(6): representing that goods are original or new if they have

deteriorated unreasonably or are altered, reconditioned, reclaimed, used, or secondhand;

e. § 1770(a)(7): representing that goods are of a particular standard, quality, or grade if they are of another;

f. § 1770(a)(9): advertising goods with intent not to sell them as advertised; and

g. § 1770(a)(16): representing the subject of a transaction has been supplied in accordance with a previous representation when it has not.

97. As a result, plaintiffs and the subclass members have suffered irreparable harm and are entitled to injunctive relief, restitution, damages, punitive damages, and attorneys' fees.

98. In compliance with Cal. Civ. Code § 1782, plaintiffs have sent written notice to Walgreens of their claims. Although plaintiffs do not currently seek damages for their claims under the CLRA, if Walgreens refuses to remedy the violation within 30 days of notice, plaintiffs may thereafter amend this Complaint to seek damages.

99. In compliance with Cal. Civ. Code § 1782(d), plaintiffs' affidavits of venue are filed concurrently herewith, attached to the Complaint as Exhibit 14.

THIRD CAUSE OF ACTION

VIOLATIONS OF THE CALIFORNIA UNFAIR COMPETITION LAW, CAL. BUS. & PROF. CODE §§ 17200 *ET SEQ.*

(By the California Subclass)

100. Plaintiffs reallege and incorporate the allegations elsewhere in the Complaint as if fully set forth herein.

101. The UCL prohibits any "unlawful, unfair or fraudulent business act or practice," Cal. Bus. & Prof. Code § 17200.

Fraudulent

102. Walgreens' claims that Well CoQ10 provides "Enhanced Absorption," and that it generally supports heart health and benefits statin users, are false and misleading, and

fraudulent under the UCL, because Well CoQ10 is ineffective in that it does not rupture, thus passing through the body's digestive tract and providing no benefit, or at most is only partially effective due to its substandard dissolution. Thus, Well CoQ10's label is likely to deceive a reasonable consumer.

103. Walgreens' omissions of material facts are also prohibited by the UCL's "fraudulent" prong.

Unfair

104. Walgreens' conduct with respect to the labeling, advertising, and sale of Well CoQ10 was unfair because Walgreens' conduct was immoral, unethical, unscrupulous, or substantially injurious to consumers and the utility of its conduct, if any, does not outweigh the gravity of the harm to its victims.

105. Walgreens' conduct with respect to the labeling, advertising, and sale of Well CoQ10 was also unfair because it violated public policy as declared by specific constitutional, statutory or regulatory provisions, including the False Advertising Law.

106. Walgreens' conduct with respect to the labeling, advertising, and sale of Well CoQ10 was also unfair because the consumer injury was substantial, not outweighed by benefits to consumers or competition, and not one consumers themselves could reasonably have avoided.

Unlawful

107. The acts alleged herein are "unlawful" under the UCL in that they violate the following laws:

- The False Advertising Law, Cal. Bus. & Prof. Code §§ 17500 *et seq.*;
- The Consumers Legal Remedies Act, Cal. Civ. Code §§ 1750 *et seq.*;
- The Magnuson-Moss Warranty Act, 15 U.S.C. §§ 2103 *et seq.*;
- The Lanham Act, 15 U.S.C. §§ 1501 *et seq.*;
- The Illinois Consumer Fraud and Deceptive Trade Practices Act, 815 ILCS §§ 505/1 *et seq.*; and
- The Illinois Uniform Deceptive Trade Practices Act, 815 ILCS §§ 510/1 *et seq.*;

* * *

108. In accordance with Cal. Bus. & Prof. Code § 17203, plaintiffs seek an order enjoining Walgreens from continuing to conduct business through unlawful, unfair, or fraudulent acts and practices, and to commence a corrective advertising campaign.

109. On behalf of themselves and the California subclass, plaintiffs also seek an order for the restitution of all monies from the sale of Well CoQ10 that were unjustly acquired through acts of unlawful, unfair, or fraudulent competition.

FOURTH CAUSE OF ACTION

VIOLATIONS OF THE ILLINOIS CONSUMER FRAUD AND DECEPTIVE BUSINESS PRACTICES ACT,

815 ILL. COMPILED STATUTES §§ 505/1 *ET SEQ.*

(By the Nationwide Class)

110. Plaintiffs reallege and incorporate the allegations elsewhere in the Complaint as if fully set forth herein.

111. Section 2 of the Illinois Consumer Fraud and Deceptive Business Practices Act (ICFA), provides that:

> Unfair methods of competition and unfair or deceptive acts or practices, including but not limited to the use of or employment of any deceptive, fraud, false pretense, false promise, misrepresentation or the concealment, suppression or omission of any material fact, with intent that others rely upon the concealment, suppression or omission of such material fact, or the use of employment of any practice described in Section 2 of the "Uniform Deceptive Trade Practices Act," approved August 5, 1965, in the conduct of any trade or commerce are hereby declared unlawful whether any person has in fact been misled, deceived or damaged thereby. In construing this section consideration shall be given to the interpretations of the Federal Trade Commission and the federal courts relating to Section 5(a) of the Federal Trade Commission Act.

815 ILCS 505/2.

112. Plaintiffs and members of the class are consumers within the meaning of ICFA.

113. Walgreens' Well CoQ10 is "merchandise," and its label, including the claims challenged herein, "advertisement[s]," within the meaning of 815 ILCS 505/1(a)-(b).

114. Walgreens' practices were addressed to the market generally and implicate consumer protection concerns. Walgreens conducted "trade and commerce" within the meaning of 815 ILCS 505/1(f).

115. Walgreens committed unfair and/or deceptive acts in violation of ICFA by engaging in the acts and practices alleged herein, including representing that Well CoQ10 provides "Enhanced Absorption," or is an "Enhanced Absorption Formula," and that it is beneficial for heart health.

116. Walgreens intended that plaintiffs and members of the class rely on its unfair and deceptive acts and omissions alleged herein so that they would purchase Well CoQ10.

117. Walgreens' actions, which were willful and wanton, constitute intentional violations of ICFA.

118. Walgreens' actions as described herein offend public policy; are immoral, unethical, oppressive, and unscrupulous; and cause substantial injury to consumers.

119. Walgreens' unlawful, unfair, or deceptive practices described herein are continuing in nature and widespread. Plaintiffs and members of the class have been damaged as a proximate result of Walgreens' violations of ICFA in that they purchased Well CoQ10 in reliance on Walgreens' false and misleading representations.

120. On behalf of themselves and the class, plaintiffs seek injunctive relief, actual and punitive damages, attorneys' fees, and any other necessary and appropriate equitable or legal relief to which they are entitled.

FIFTH CAUSE OF ACTION

VIOLATION OF ILLINOIS UNIFORM DECEPTIVE TRADE PRACTICES ACT

815 ILL. COMPILED STATUTES §§ 510/1 *ET SEQ.*

(By the Nationwide Class)

121. Plaintiffs reallege and incorporate the allegations elsewhere in the Complaint as if fully set forth herein.

122. Section 2 of the Illinois Uniform Deceptive Trade Practices Act (UDTPA) provides that "[a] person engaged in a deceptive trade practice when, in the course of his or her business, vocation, or occupation," the person, among other things:

(ii) "causes likelihood of confusion or of misunderstanding as to the source, sponsorship, approval, or certification of goods or services," 815 ILCS § 510/2(a)(2);

(iii) "represents that goods or services have sponsorship, approval, characteristics, ingredients, uses, benefits, or quantities that they do not have or that a person has a sponsorship, approval, status, affiliation, or connection that he or she does not have," *id.* § 510/2(a)(5);

(iv) "represents that the goods or services are original or new if they are deteriorated, altered, reconditioned, reclaimed, used, or secondhand," *id.* § 510/2(a)(6);

(v) "represents that goods or services are of a particular standard, quality, or grade or that goods are of a particular style or model, if they are of another," *id.* § 510/2(a)(7);

(vi) "advertises goods or services with intent not to sell them as advertised," *id.* § 510/2(a)(9); or

(vii) "engages in any other conduct which similarly creates a likelihood of confusion or misunderstanding," *id.* § 510/2(a)(12).

123. As alleged herein, Walgreens willfully violated the preceding sections of the UDTPA by making the false and misleading representations challenged herein.

124. Pursuant to 815 ILCS § 510/3, plaintiffs on behalf of themselves and the class members seek injunctive relief and attorneys' fees.

PRAYER FOR RELIEF

125. Wherefore, plaintiffs, on behalf of themselves, all others similarly situated and the general public, prays for judgment against Walgreens as to each and every cause of action, and the following remedies:

A. An Order certifying this as a class action and appointing plaintiffs and their counsel to represent the class and subclass;

B. An Order enjoining Walgreens from labeling, advertising, or packaging Well CoQ10 with any absorption, benefit or efficacy claim challenged herein;

D. An Order compelling Walgreens to conduct a corrective advertising campaign to inform the public that Well CoQ10 did not provide the advertised efficacy or benefits;

E. An Order requiring Walgreens to disgorge or return all monies, revenues, and profits obtained by means of any wrongful or unlawful act or practice;

F. An Order requiring Walgreens to pay all actual and statutory damages permitted under the causes of action alleged herein;

G. An Order requiring Walgreens to pay restitution to restore all funds acquired by means of any act or practice declared by this Court to be an unlawful, unfair, or fraudulent business act or practice, untrue or misleading advertising, or a violation of the UCL, FAL or CLRA, plus pre-and post-judgment interest thereon;

H. Costs, expenses, and reasonable attorneys' fees; and

I. Any other and further relief the Court deems necessary, just, or proper.

JURY DEMAND

126. Plaintiff hereby demands a trial by jury on all issues so triable.

Dated: January 23, 2015

/s/ Jack Fitzgerald

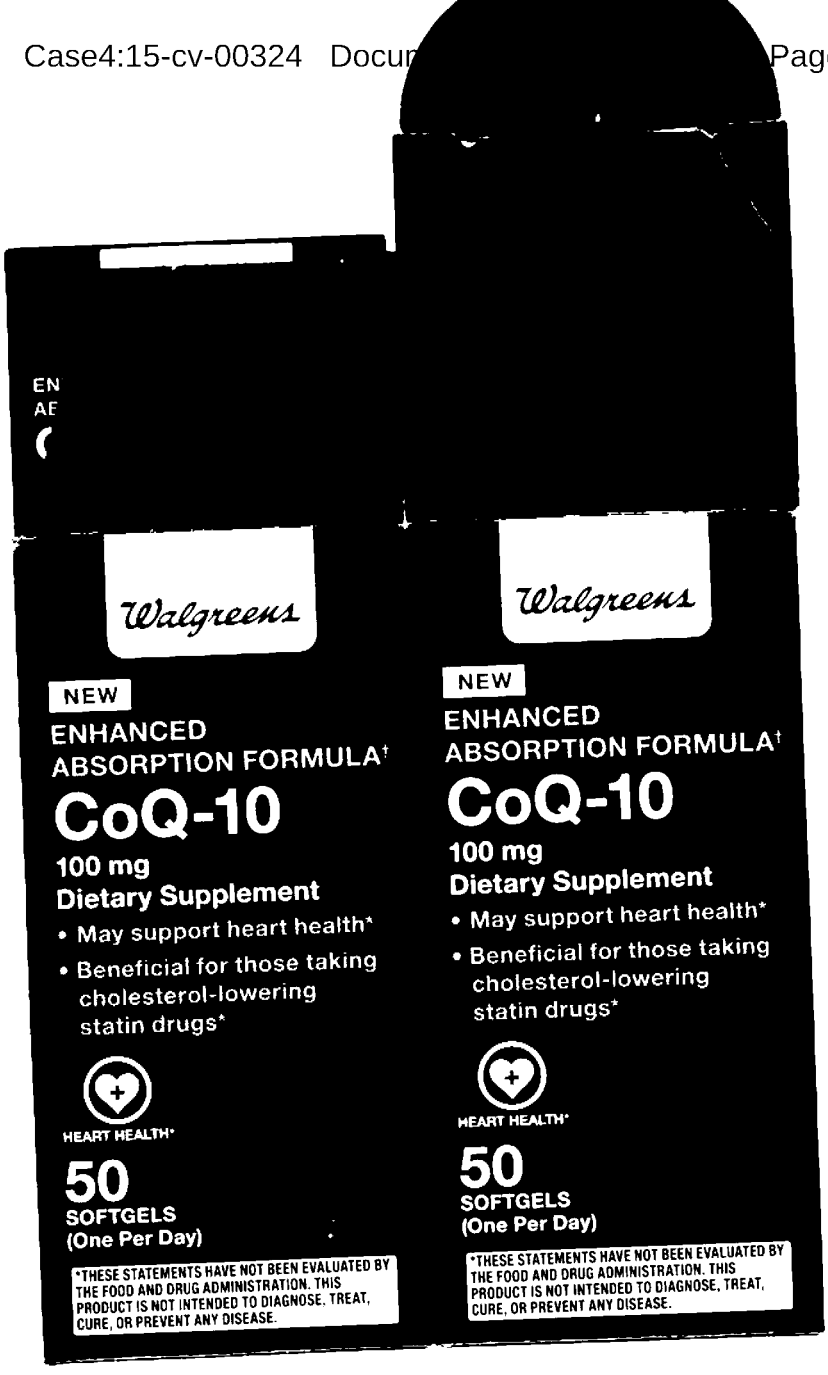
THE LAW OFFICE OF JACK FITZGERALD, PC
JACK FITZGERALD
jack@jackfitzgeraldlaw.com
TREVOR M. FLYNN (253362)
trevor@jackfitzgeraldlaw.com
TRAN NGUYEN (310593)
tran@jackfitzgeraldlaw.com
Hillcrest Professional Building
3636 4th Ave., Ste. 202
San Diego, CA 92103
Phone: (619) 692-3840

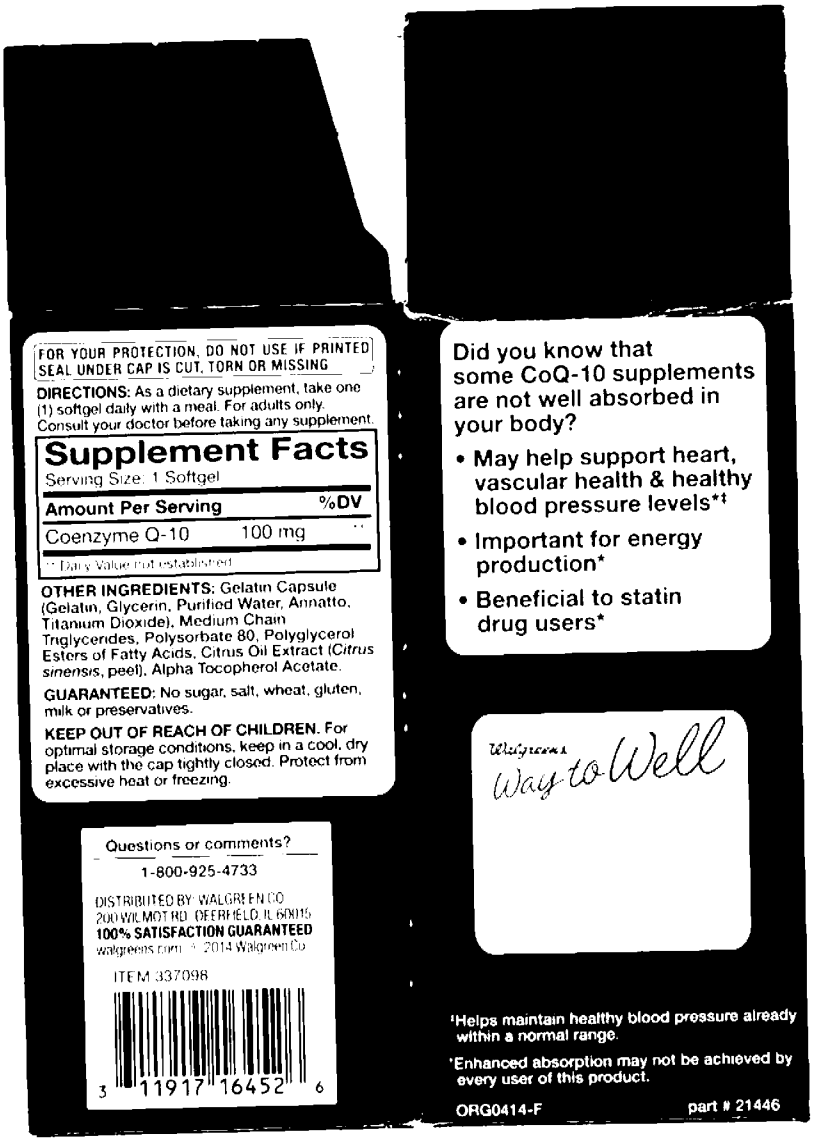
Fax: (619) 362-9555

LAW OFFICES OF RONALD A. MARRON, APLC
RONALD A. MARRON
ron@consumersadvocates.com
SKYE RESENDES
skye@consumersadvocates.com
ALEXIS M. WOOD
alexis@consumersadvocates.com
651 Arroyo Drive
San Diego, CA 92103
Phone: (619) 696-9006
Fax: (619) 564-6665

Counsel for Plaintiffs and the Putative Class

Exhibit 1


EN
AE
Walgreens
NEW
ENHANCED
ABSORPTION FORMULA†
CoQ-10
100 mg
Dietary Supplement
• May support heart health*
• Beneficial for those taking cholesterol-lowering statin drugs*
HEART HEALTH*
50
SOFTGELS
(One Per Day)
*THESE STATEMENTS HAVE NOT BEEN EVALUATED BY THE FOOD AND DRUG ADMINISTRATION. THIS PRODUCT IS NOT INTENDED TO DIAGNOSE, TREAT, CURE, OR PREVENT ANY DISEASE.
Walgreens
NEW
ENHANCED
ABSORPTION FORMULA†
CoQ-10
100 mg
Dietary Supplement
• May support heart health*
• Beneficial for those taking cholesterol-lowering statin drugs*
HEART HEALTH*
50
SOFTGELS
(One Per Day)
*THESE STATEMENTS HAVE NOT BEEN EVALUATED BY THE FOOD AND DRUG ADMINISTRATION. THIS PRODUCT IS NOT INTENDED TO DIAGNOSE, TREAT, CURE, OR PREVENT ANY DISEASE.



FOR YOUR PROTECTION, DO NOT USE IF PRINTED SEAL UNDER CAP IS CUT, TORN OR MISSING

DIRECTIONS: As a dietary supplement, take one (1) softgel daily with a meal. For adults only. Consult your doctor before taking any supplement.

Supplement Facts

Serving Size: 1 Softgel

Amount Per Serving	%DV
Coenzyme Q-10 100 mg	**

** Daily Value not established

OTHER INGREDIENTS: Gelatin Capsule (Gelatin, Glycerin, Purified Water, Annatto, Titanium Dioxide), Medium Chain Triglycerides, Polysorbate 80, Polyglycerol Esters of Fatty Acids, Citrus Oil Extract (*Citrus sinensis*, peel), Alpha Tocopherol Acetate.

GUARANTEED: No sugar, salt, wheat, gluten, milk or preservatives.

KEEP OUT OF REACH OF CHILDREN. For optimal storage conditions, keep in a cool, dry place with the cap tightly closed. Protect from excessive heat or freezing.

Questions or comments?

1-800-925-4733

DISTRIBUTED BY: WALGREEN CO.
200 WILMOT RD. DEERFIELD, IL 60015
100% SATISFACTION GUARANTEED
walgreens.com © 2014 Walgreen Co.

ITEM 337098

3 11917 16452 6

Did you know that some CoQ-10 supplements are not well absorbed in your body?

- May help support heart, vascular health & healthy blood pressure levels*†
- Important for energy production*
- Beneficial to statin drug users*

Walgreens
Way to Well

*Helps maintain healthy blood pressure already within a normal range.

†Enhanced absorption may not be achieved by every user of this product.

ORG0414-F part # 21446

Exhibit 2

Mobile phase, System suitability solution, Sample solution, Chromatographic system, and System suitability: Proceed as directed in the *Assay*.

Analysis

Sample: *Sample solution*

Calculate the percentage of impurities in the portion of Ubidecarenone taken:

$$\text{Result} = (r_{T1}/r_{T2}) \times 100$$

r_{T1} = sum of all peak responses, other than that for ubidecarenone

r_{T2} = sum of all peak responses

Acceptance criteria: NMT 1.0%

Procedure 2: Ubidecarenone (2*Z*)-Isomer and Related Impurities

Mobile phase: *n*-Hexane and ethyl acetate (97:3)

System suitability solution: 1 mg/mL of USP Ubidecarenone for System Suitability RS in *n*-hexane

Sample solution: 1 mg/mL of Ubidecarenone in *n*-hexane

Chromatographic system

(See *Chromatography* ⟨621⟩, *System Suitability*.)

Mode: LC

Detector: UV 275 nm

Column: 4.6-mm × 25-cm; packing L3

Flow rate: 2 mL/min

Injection size: 20 µL

System suitability

Sample: *System suitability solution*

[NOTE—The relative retention times for ubidecarenone (2*Z*)-isomer and ubidecarenone are about 0.85 and 1.0, respectively.]

Suitability requirements

Resolution: NLT 1.5 between the ubidecarenone (2*Z*)-isomer and ubidecarenone

Analysis

Sample: *Sample solution*

Calculate the percentage of impurities in the portion of Ubidecarenone taken:

$$\text{Result} = (r_{T1}/r_{T2}) \times 100$$

r_{T1} = sum of all peak responses, other than that for ubidecarenone

r_{T2} = sum of all peak responses

Acceptance criteria: NMT 1.0%

Total impurities: NMT 1.5%, obtained from *Chromatographic Purity Procedures 1* and *2*

SPECIFIC TESTS

- **WATER DETERMINATION,** *Method I* ⟨921⟩: NMT 0.2%

ADDITIONAL REQUIREMENTS

- **PACKAGING AND STORAGE:** Preserve in well-closed, light-resistant containers.
- **USP REFERENCE STANDARDS** ⟨11⟩

USP Ubidecarenone RS

USP Ubidecarenone Related Compound A RS [coenzyme Q_9]

USP Ubidecarenone for System Suitability RS

Ubidecarenone Capsules

DEFINITION

Ubidecarenone Capsules contain NLT 90.0% and NMT 115.0% of the labeled amount of ubidecarenone ($C_{59}H_{90}O_4$).

IDENTIFICATION

- **A.** The retention time of the major peak of either *Sample solution 1* or *Sample solution 2* corresponds to that of the *Standard solution*, as obtained in the *Procedure* for *Strength*.

STRENGTH

- **PROCEDURE**

[NOTE—Conduct this test promptly with minimum exposure to actinic light.]

Solvent: *n*-Hexane and dehydrated alcohol (5:2)

Mobile phase: Acetonitrile, tetrahydrofuran, and water (55:40:5)

Standard stock solution: 1.0 mg/mL of USP Ubidecarenone RS in *Solvent*

Standard solution: 40 µg/mL in dehydrated alcohol, from the *Standard stock solution*

System suitability stock solution: 1.0 mg/mL of USP Ubidecarenone Related Compound A RS in *Solvent*. Dilute a portion of this solution with dehydrated alcohol to obtain a concentration of 40 µg/mL.

System suitability solution: *Standard solution* and *System suitability stock solution* (1:1)

Sample solution 1 (for soft gelatin Capsules): Open a number of Capsules equivalent to 200 mg of ubidecarenone, quantitatively transfer the shells and contents to a container, add 100 mL of *Solvent*, and shake by mechanical means for 30 min. Using small portions of *Solvent*, quantitatively transfer this mixture to a 200-mL volumetric flask, and dilute with *Solvent* to volume. Centrifuge a portion of this solution, transfer 1.0 mL of the supernatant to a 25-mL volumetric flask, add 2.5 mL of a 0.1% solution of anhydrous ferric chloride in alcohol, and dilute with alcohol to volume.

Sample solution 2 (for hard gelatin Capsules): Empty and thoroughly mix the contents of NLT 20 Capsules. Transfer a portion of the powder, equivalent to 100 mg of ubidecarenone, to a 100-mL volumetric flask, add 60 mL of *Solvent*, and shake by mechanical means for 30 min. Dilute with *Solvent* to volume. Centrifuge a portion of this solution, transfer 1.0 mL of the supernatant to a 25-mL volumetric flask, add 2.5 mL of a 0.1% solution of anhydrous ferric chloride in alcohol, and dilute with alcohol to volume.

Chromatographic system

(See *Chromatography* ⟨621⟩, *System Suitability*.)

Mode: LC

Detector: UV 280 nm

Column: 8-mm × 10-cm; packing L1

Flow rate: 2.5 mL/min

Injection size: 15 µL

System suitability

Samples: *Standard solution* and *System suitability solution*

Suitability requirements

Resolution: NLT 2.5 between ubidecarenone and ubidecarenone related compound A, *System suitability solution*

Tailing factor: NMT 1.5, *Standard solution*

Relative standard deviation: NMT 2.0% for ubidecarenone, *Standard solution*

Analysis

Samples: *Sample solution 1* or *Sample solution 2*, and *Standard solution*

Calculate the percentage of the labeled amount of ubidecarenone ($C_{59}H_{90}O_4$) in the portion of Capsules taken:

$$\text{Result} = (r_U/r_S) \times (C_S/C_U) \times 100$$

r_U = peak area of ubidecarenone from *Sample solution 1* or *Sample solution 2*

r_S = peak area of ubidecarenone from the *Standard solution*

C_S = concentration of USP Ubidecarenone RS in the *Standard solution* (mg/mL)

C_U = nominal concentration of ubidecarenone in *Sample solution 1* or *Sample solution 2* (mg/mL)

Acceptance criteria: 90.0%–115.0%

PERFORMANCE TESTS

- **DISINTEGRATION AND DISSOLUTION ⟨2040⟩:** Meet the requirements of the test for *Disintegration*, except where the product is labeled to contain a water-soluble form of ubidecarenone. Capsules labeled to contain a water-soluble form of ubidecarenone meet the requirements for the test for *Dissolution*, as follows.

Medium: Water; 500 mL
Apparatus 2: 75 rpm
Time: 60 min
Standard solution: Dissolve 25 mg of USP Ubidecarenone RS in 1 mL of ethyl ether, and dilute with alcohol to obtain a concentration of 2.5 µg/mL. [NOTE—Use a freshly prepared solution only.]
Sample solution: Dilute with alcohol a volume of the solution under test, previously passed through a suitable filter of 0.45-µm pore size, to obtain a concentration of 2.5 µg/mL of ubidecarenone.
Mobile phase and **Chromatographic system:** Proceed as directed in the *Procedure* for *Strength*, except for *Injection size*.
Injection size: 100 µL
Analysis
Samples: *Standard solution* and *Sample solution*
Calculate the percentage of the labeled amount of ubidecarenone ($C_{59}H_{90}O_4$) dissolved:

$$\text{Result} = (r_U/r_S) \times (C_S \times V \times D/L) \times 100$$

r_U = peak area of ubidecarenone from the *Sample solution*
r_S = peak area of ubidecarenone from the *Standard solution*
C_S = concentration of USP Ubidecarenone RS in the *Standard solution* (mg/mL)
V = volume of *Medium*, 500 mL
D = dilution factor for the *Sample solution*
L = label claim (mg/Capsule)

Tolerances: NLT 75% of the labeled amount of ubidecarenone ($C_{59}H_{90}O_4$) is dissolved.

SPECIFIC TESTS

- **WEIGHT VARIATION ⟨2091⟩:** Meet the requirements

ADDITIONAL REQUIREMENTS

- **PACKAGING AND STORAGE:** Preserve in tight, light-resistant containers.
- **LABELING:** Where the product contains a water-soluble form of ubidecarenone, this is so stated on the label.
- **USP REFERENCE STANDARDS ⟨11⟩**
USP Ubidecarenone RS
USP Ubidecarenone Related Compound A RS
Coenzyme Q_9.

Ubidecarenone Tablets

DEFINITION

Ubidecarenone Tablets contain NLT 90.0% and NMT 115.0% of the labeled amount of ubidecarenone ($C_{59}H_{90}O_4$).

IDENTIFICATION

- **A.** The retention time of the major peak of the *Sample solution* corresponds to that of the *Standard solution*, as obtained in the *Procedure* for *Strength*.

STRENGTH

- **PROCEDURE**

[NOTE—Conduct this test promptly with minimum exposure to actinic light.]
Solvent: *n*-Hexane and dehydrated alcohol (5:2)
Mobile phase: Acetonitrile, tetrahydrofuran, and water (11:8:1)
Standard stock solution: 1.0 mg/mL of USP Ubidecarenone RS in *Solvent*
Standard solution: 40 µg/mL from *Standard stock solution* in dehydrated alcohol
System suitability stock solution: 1.0 mg/mL of USP Ubidecarenone Related Compound A RS in *Solvent*. Dilute a portion of this solution with dehydrated alcohol to obtain a concentration of 40 µg/mL.
System suitability solution: *Standard solution* and *System suitability stock solution* (1:1)
Sample stock solution: Weigh and finely powder NLT 20 Tablets. Transfer a quantity of powder, equivalent to about 100 mg of ubidecarenone, to a 100-mL volumetric flask, add 60 mL of *Solvent*, and shake by mechanical means for 30 min. Dilute with *Solvent* to volume, and mix. Centrifuge a portion of this solution, transfer 1.0 mL of the supernatant to a 25-mL volumetric flask, and add 2.5 mL of a 0.1% solution of anhydrous ferric chloride in alcohol. Dilute with alcohol to volume, and mix.
Sample solution: Centrifuge a portion of *Sample stock solution*, transfer 1.0 mL of the supernatant to a 25-mL volumetric flask, add 2.5 mL of a 0.1% solution of anhydrous ferric chloride in alcohol, and dilute with alcohol to volume.
Chromatographic system
(See *Chromatography ⟨621⟩, System Suitability*.)
Mode: LC
Detector: UV 280 nm
Column: 8-mm × 10-cm; packing L1
Flow rate: 2.5 mL/min
Injection size: 15 µL
System suitability
Samples: *Standard solution* and *System suitability solution*
Suitability requirements
Resolution: NLT 2.5 between ubidecarenone and ubidecarenone related compound A, *System suitability solution*
Tailing factor: NMT 1.5, *Standard solution*
Relative standard deviation: NMT 2.0% for ubidecarenone, *Standard solution*
Analysis
Samples: *Standard solution* and *Sample solution*
Calculate the percentage of the labeled amount of ubidecarenone ($C_{59}H_{90}O_4$) in the portion of Tablets taken:

$$\text{Result} = (r_U/r_S) \times (C_S/C_U) \times 100$$

r_U = peak area of ubidecarenone from the *Sample solution*
r_S = peak area of ubidecarenone from the *Standard solution*
C_S = concentration of USP Ubidecarenone RS in the *Standard solution* (mg/mL)
C_U = nominal concentration of ubidecarenone in the *Sample solution* (mg/mL)

Acceptance criteria: 90.0%–115.0%

PERFORMANCE TESTS

- **DISINTEGRATION AND DISSOLUTION ⟨2040⟩:** Meet the requirements of the test for *Disintegration*, except where the product is labeled to contain a water-soluble form of ubidecarenone. Tablets labeled to contain a water-soluble form of ubidecarenone meet the requirements for the test for *Dissolution*, as follows.

Exhibit 3

782

⟨2040⟩ DISINTEGRATION AND DISSOLUTION OF DIETARY SUPPLEMENTS

INTRODUCTION

This general chapter is provided to determine compliance with the disintegration and dissolution standards for dietary supplements where stated in the individual monographs.

For the purposes of this chapter, dietary supplement dosage forms have been divided into three categories: *Vitamin–Mineral Dosage Forms, Botanical Dosage Forms,* and *Dietary Supplements Other Than Vitamin–Mineral and Botanical Dosage Forms. Vitamin–Mineral Dosage Forms* includes articles prepared with vitamins, minerals, or combinations of these dietary ingredients (e.g., USP dietary supplements *Class I* to *Class VI*, described below). *Botanical Dosage Forms* comprises formulations containing ingredients of botanical origin, including plant materials and extracts. *Dietary Supplements Other Than Vitamin–Mineral and Botanical Dosage Forms* encompasses dietary supplements formulated with lawfully recognized dietary ingredients that are different from those pertaining to the two foregoing categories (e.g., amino acids, chondroitin, and glucosamine).

Where a dietary supplement represents a combination of the categories mentioned above, and there is a difference between the requirements for the individual categories, the more stringent requirement applies.

Dissolution testing as described in this chapter is a quality-control tool to enable the performance of dietary supplements to be routinely assessed.

DISINTEGRATION

This test is provided to determine whether dietary supplement tablets or capsules disintegrate within the prescribed time when placed in a liquid medium at the experimental conditions presented below. Compliance with the limits on *Disintegration* stated in the individual monographs for dietary supplements is required except where the label states that the products are intended for use as troches, are to be chewed, or are designed as extended-release dosage forms. Dietary supplements claiming to be extended-release dosage forms must comply with standards other than disintegration to verify that the release of the dietary ingredients from the dosage form is for a defined period of time. Dietary supplements claiming to be extended-release dosage forms shall not be labeled as in compliance with USP unless a USP monograph exists for such product. Determine the type of units under test from the labeling and from observation, and apply the appropriate procedure to 6 or more units.

For purposes of this test, disintegration does not imply complete solution of the unit or even of its active constituent. Complete disintegration is defined as that state in which any residue of the unit, except fragments of insoluble coating or capsule shell, remaining on the screen of the test apparatus or adhering to the lower surface of the disk, if used, is a soft mass having no palpably firm core.

Apparatus

Apparatus A—Use the *Apparatus* described under *Disintegration* ⟨701⟩ for tablets or capsules that are not greater than 18 mm long. For larger tablets or capsules, use *Apparatus B.*

Apparatus B—The apparatus[1] consists of a basket-rack assembly, a 1000-mL, low-form beaker for the immersion fluid, a thermostatic arrangement for heating the fluid between 35° and 39°, and a device for raising and lowering the basket in the immersion fluid at a constant frequency rate between 29 and 32 cycles per minute through a distance of not less than 53 mm and not more than 57 mm. The volume of the fluid in the vessel is such that at the highest point of the upward stroke the wire mesh remains at least 15 mm below the surface of the fluid and descends to not less than 25 mm from the bottom of the vessel on the downward stroke. At no time should the top of the basket-rack assembly become submerged. The time required for the upward stroke is equal to the time required for the downward stroke, and the change in stroke direction is a smooth transition rather than an abrupt reversal of motion. The basket-rack assembly moves vertically along its axis. There is no appreciable horizontal motion or movement of the axis from the vertical.

Basket-Rack Assembly—The basket-rack assembly consists of three open-ended transparent tubes, each 77.5 ± 2.5 mm long and having an inside diameter of 32.0 to 34.6 mm and a wall 2.0 to 3.0 mm thick; the tubes are held in a vertical position by two plastic plates, each about 97 mm in diameter and 7.5 to 10.5 mm in thickness, with three holes, each about 33 to 34 mm in diameter, equidistant from the center of the plate and equally spaced from one another. Attached to the under surface of the lower plate is 10-mesh No. 23 (0.025-inch) W. and M. gauge woven stainless-steel wire cloth having a plain square weave. The parts of the apparatus are assembled and rigidly held by means of three bolts passing through the two plastic plates. A suitable means is provided to suspend the basket-rack assembly from the raising and lowering device using a point on its axis.

The design of the basket-rack assembly may be varied somewhat provided the specifications for the glass tubes and the screen mesh size are maintained.

Disks—Each tube is provided with a perforated cylindrical disk 15.3 ± 0.15 mm thick and 31.4 ± 0.13 mm in diameter. The disk is made of a suitable, transparent plastic material having a specific gravity of between 1.18 and 1.20. Seven 3.15 ± 0.1-mm holes extend between the ends of the cylinder, one of the holes being through the cylinder axis and the others parallel with it and equally spaced on a 4.2 ± 0.1-mm radius from it. All surfaces of the disk are smooth.[2]

Procedure

Uncoated Tablets—Place 1 tablet in each of the tubes of the basket and, if prescribed, add a disk to each tube. Operate the apparatus, using water or the specified medium as the immersion fluid, maintained at 37 ± 2°. At the end of 30 minutes, lift the basket from the fluid, and observe the tablets: all of the tablets disintegrate completely. If 1 or 2 tablets fail to disintegrate completely, repeat the test on 12 additional tablets. The requirement is met if not fewer than 16 of the total of 18 tablets tested disintegrate completely.

Plain Coated Tablets—Place 1 tablet in each of the tubes of the basket and, if the tablet has a soluble external sugar coating, immerse the basket in water at room temperature for 5 minutes. Then, if prescribed, add a disk to each tube, and operate the apparatus, using water or the specified medium as the immersion fluid, maintained at 37 ± 2°. At the end of 30 minutes, lift the basket from the fluid, and observe the tablets: all of the tablets disintegrate completely. If 1 or 2 tablets fail to disintegrate completely, repeat the test on 12 additional tablets. The requirement is met if not fewer than 16 of the total of 18 tablets tested disintegrate completely.

Delayed-Release (Enteric-Coated) Tablets—Place 1 tablet in each of the six tubes of the basket, and if the tablet has a soluble external sugar coating, immerse the basket in water at room temperature for 5 minutes. Then operate the apparatus using simulated gastric fluid TS maintained at 37 ± 2° as the immersion fluid. After

[1] An apparatus and disks meeting these specifications are available from Varian Inc., 13000 Weston Parkway, Cary, NC 27513, or from laboratory supply houses.

[2] The use of automatic detection employing modified disks is permitted where the use of disks is specified or allowed. Such disks must comply with the requirements for density and dimensions given in this chapter.

1 hour of operation in simulated gastric fluid TS, lift the basket from the fluid, and observe the tablets: the tablets show no evidence of disintegration, cracking, or softening. Operate the apparatus, using simulated intestinal fluid TS, maintained at 37 ± 2°, as the immersion fluid for the time specified in the monograph. Lift the basket from the fluid, and observe the tablets: all of the tablets disintegrate completely. If 1 or 2 tablets fail to disintegrate completely, repeat the test on 12 additional tablets: not fewer than 16 of the total of 18 tablets tested disintegrate completely.

Buccal Tablets—Apply the test for *Uncoated Tablets*. After 4 hours, lift the basket from the fluid, and observe the tablets: all of the tablets disintegrate completely. If 1 or 2 tablets fail to disintegrate completely, repeat the test on 12 additional tablets: not fewer than 16 of the total of 18 tablets tested disintegrate completely.

Sublingual Tablets—Apply the test for *Uncoated Tablets*. At the end of the time limit specified in the individual monograph, all of the tablets disintegrate completely. If 1 or 2 tablets fail to disintegrate completely, repeat the test on 12 additional tablets: not fewer than 16 of the total of 18 tablets tested disintegrate completely.

Hard Shell Capsules—Apply the test for *Uncoated Tablets,* using as the immersion fluid, maintained at 37 ± 2°, a 0.05 M acetate buffer prepared by mixing 2.99 g of sodium acetate trihydrate and 1.66 mL of glacial acetic acid with water to obtain a 1000-mL solution having a pH of 4.50 ± 0.05. Attach a removable wire cloth, as described under *Basket-Rack Assembly,* to the surface of the upper plate of the basket-rack assembly. At the end of 30 minutes, lift the basket from the fluid, and observe the capsules: all of the capsules disintegrate except for fragments from the capsule shell. If 1 or 2 capsules fail to disintegrate completely, repeat the test on 12 additional capsules: not fewer than 16 of the total of 18 capsules tested disintegrate completely.

Soft Shell Capsules—Proceed as directed under *Rupture Test for Soft Shell Capsules.*

Use of Disks—

VITAMIN–MINERAL DOSAGE FORMS—Add a disk to each tube unless otherwise specified in the individual monograph.

BOTANICAL DOSAGE FORMS—Omit the use of disks unless otherwise specified in the individual monograph.

DIETARY SUPPLEMENTS OTHER THAN VITAMIN–MINERAL AND BOTANICAL DOSAGE FORMS—Omit the use of disks unless otherwise specified in the individual monograph.

NOTE—The use of disks for enteric-coated tablets is not permitted.

RUPTURE TEST FOR SOFT SHELL CAPSULES

Medium: water; 500 mL.

Apparatus—Use *Apparatus 2* as described under *Dissolution* ⟨711⟩, operating at 50 rpm.

Time: 15 minutes.

Procedure—Place 1 capsule in each vessel, and allow the capsule to sink to the bottom of the vessel before starting rotation of the blade. Observe the capsules, and record the time taken for each capsule shell to rupture.

Tolerances—The requirements are met if all of the capsules tested rupture in not more than 15 minutes. If 1 or 2 of the capsules rupture in more than 15 but not more than 30 minutes, repeat the test on 12 additional capsules: not more than 2 of the total of 18 capsules tested rupture in more than 15 but not more than 30 minutes.

Change to read:

DISSOLUTION

This test is provided to determine compliance with the *Dissolution* requirements where stated in the individual monograph for dietary supplements, except where the label states that tablets are to be chewed.

See *Dissolution* ⟨711⟩ for description of apparatus used, *Apparatus Suitability Test,* and other related information. Of the types of apparatus described in ⟨711⟩, use the one specified in the individual monograph.

•Soft gelatin capsule preparations of dietary supplements meet the requirements for *Disintegration.*

Official until May 1, 2010

• (RB 1-May-2009)

For hard or soft gelatin capsules and gelatin-coated tablets that do not conform to the dissolution specification, repeat the test as follows. Where water or a medium with a pH of less than 6.8 is specified as the *Medium* in the individual monograph, the same *Medium* specified may be used with the addition of purified pepsin that results in an activity of 750,000 Units or less per 1000 mL. For media with a pH of 6.8 or greater, pancreatin can be added to produce not more than 1750 USP Units of protease activity per 1000 mL.

This nonspecific dissolution is intended to be diagnostic of known technological problems that may arise as a result of coatings, lubricants, disintegrants, and other substances inherent in the manufacturing process. For dosage forms containing botanical extracts, this dissolution measurement allows an assessment of the extent of decomposition of the extract to polymeric or other nondissoluble compounds that may have been produced by excessive drying or other manipulations involved in the manufacture of botanical extracts. The operative assumption inherent in this procedure is that if the index or marker compound(s) or the extract is demonstrated to have dissolved within the time frame and under conditions specified, the dosage form does not suffer from any of the above formulation or manufacturing related problems.

Vitamin–Mineral Dosage Forms

All dietary supplements belonging to USP *Classes II* to *VI,* prepared as tablets or capsules, are subject to the dissolution test and criteria described in this chapter for folic acid (if present) and for index vitamins and index minerals. This test is required because of the importance of the relationship between folate deficiency and the risk of neural tube defects. The accompanying table lists the dissolution requirements for the individual USP classes of dietary supplements. *Class I* dietary supplements are combinations of oil-soluble vitamins for which dissolution standards are not established; hence, dissolution requirements do not apply to the oil-soluble vitamins contained in formulations belonging to *Class IV* or *Class V.* Vitamin–mineral combinations that may not be strictly covered by USP *Class I* to *Class VI* are subject to the dissolution test and criteria specified in the individual monographs.

Dietary Supplements—Vitamin–Mineral Dosage Forms

USP Class	Combination of Vitamins or Minerals Present	Dissolution Requirement
I	Oil-Soluble Vitamins	not applicable
II	Water-Soluble Vitamins	one index vitamin; folic acid (if present)
III	Water-Soluble Vitamins with Minerals	one index vitamin and one index element; folic acid (if present)
IV	Oil- and Water-Soluble Vitamins	one index water-soluble vitamin; folic acid (if present)
V	Oil- and Water-Soluble Vitamins with Minerals	one index water-soluble vitamin and one index element; folic acid (if present)
VI	Minerals	one index element

Unless otherwise stated in the individual monograph, test 6 dosage units for dissolution as directed under *Dissolution* ⟨711⟩.

DISSOLUTION CONDITIONS FOR FOLIC ACID

NOTE—Perform this test under light conditions that minimize photo degradation.

Medium: water; 900 mL. If the units tested do not meet the requirements for dissolution in water, test 6 additional dosage units for dissolution in a medium of 900 mL of 0.05 M pH 6.0 citrate buffer solution, prepared by mixing 9.5 mL of 0.1 M citric acid monohydrate and 40.5 mL of 0.1 M sodium citrate dihydrate in a 100-mL volumetric flask, diluting with water to volume, mixing, and adjusting to a pH of 6.0 by using either 0.1 M hydrochloric acid or 0.1 M sodium hydroxide solution.

Apparatus 1: 100 rpm, for capsules.

Apparatus 2: 75 rpm, for tablets.

Time: 1 hour.

NOTE—Compliance with the dissolution requirements for folic acid does not exempt the product from dissolution testing of the pertinent index vitamin or the corresponding index mineral.

DISSOLUTION CONDITIONS FOR INDEX VITAMINS AND INDEX MINERALS

Medium: 0.1 N hydrochloric acid; 900 mL.

Apparatus 1: 100 rpm, for capsules.

Apparatus 2: 75 rpm, for tablets.

Time: 1 hour.

For formulations containing 25 mg or more of the index vitamin, riboflavin, use the following conditions:

Medium: 0.1 N hydrochloric acid; 1800 mL.

Apparatus 1: 100 rpm, for capsules.

Apparatus 2: 75 rpm, for tablets.

Time: 1 hour.

NOTE—Compliance with dissolution requirements for the pertinent index vitamin or index mineral does not exempt the product from dissolution testing of folic acid, if present.

SELECTION OF INDEX VITAMINS AND INDEX ELEMENTS

Compliance with the dissolution requirements for dietary supplements representing combinations of water-soluble vitamins (*Water-Soluble Vitamins Capsules* and *Water-Soluble Vitamins Tablets*) and combinations of oil- and water-soluble vitamins (*Oil- and Water-Soluble Vitamins Capsules* and *Oil- and Water-Soluble Vitamins Tablets*) is determined by measuring the dissolution of a single index vitamin from the water-soluble vitamins present. Riboflavin is the index vitamin when present in the formulation. For formulations that do not contain riboflavin, pyridoxine is the index vitamin. If neither riboflavin nor pyridoxine is present in the formulation, the index vitamin is niacinamide (or niacin), and in the absence of niacinamide (or niacin), the index vitamin is thiamine. If none of the above four water-soluble vitamins is present in the formulation, the index vitamin is ascorbic acid.

Compliance with the dissolution requirements for dietary supplements representing combinations of minerals (*Minerals Capsules* and *Minerals Tablets*) is determined by measuring the dissolution of only one index element. Iron is the index element when present in the formulation. For formulations that do not contain iron, the index element is calcium. If neither iron nor calcium is present, the index element is zinc, and in the absence of all three of these elements, magnesium is the index element.

Compliance with dissolution requirements for dietary supplements representing combinations of water-soluble vitamins and minerals (*Water-Soluble Vitamins with Minerals Capsules* and *Water-Soluble Vitamins with Minerals Tablets*) and combinations of oil- and water-soluble vitamins and minerals (*Oil- and Water-Soluble Vitamins with Minerals Capsules* and *Oil- and Water-Soluble Vitamins with Minerals Tablets*) is determined by measuring the dissolution of one index water-soluble vitamin and one index element, designated according to the respective hierarchies described above.

PROCEDURES

In the following procedures, combine equal volumes of the filtered solutions of the 6 individual specimens withdrawn, and determine the amount of folic acid or the index vitamin or element dissolved, based on the average of 6 units tested. Make any necessary modifications including concentration of the analyte in the volume of test solution taken. Use the *Medium* for preparation of the Standard solution and dilution, if necessary, of the test solution.

Folic Acid—Determine the amount of $C_{19}H_{19}N_7O_6$ dissolved by employing the procedure set forth in the *Assay for folic acid* under *Oil- and Water-Soluble Vitamins with Minerals Tablets*, in comparison with a Standard solution having a known concentration of USP Folic Acid RS in the same *Medium*.

Niacin or Niacinamide, Pyridoxine, Riboflavin, and Thiamine—Determine the amount of the designated index vitamin dissolved by employing the procedure set forth in the *Assay for niacin or niacinamide, pyridoxine, riboflavin, and thiamine* under *Water-Soluble Vitamins Tablets.*

Ascorbic Acid—Determine the amount of $C_6H_8O_6$ dissolved by adding 10 mL of 1.0 N sulfuric acid and 3 mL of starch TS to 100.0 mL of test solution, and titrating immediately with 0.01 N iodine VS. Perform a blank determination, and make any necessary correction.

Iron, Calcium, Magnesium, and Zinc—Determine the amount of the designated index element dissolved by employing the procedure set forth in the appropriate *Assay* under *Minerals Capsules*.

TOLERANCES

The requirements are met if not less than 75% of the labeled content of folic acid and not less than 75% of the labeled content of the index vitamin or the index element from the units tested is dissolved in 1 hour.

Botanical Dosage Forms

Compliance with dissolution requirements necessitates the testing of 6 dosage units individually, or testing 2 or more dosage units in each of the 6 vessels of the dissolution apparatus, and measuring the dissolution of one or more index/marker compound(s) or the extract specified in the individual monograph.

PROCEDURES

Combine equal volumes of the filtered solutions of the 6 or more individual specimens withdrawn, and use the pooled sample as the test solution. Determine the average amount of index or marker compound(s) or the extract dissolved in the pooled sample by the *Procedure* specified in the individual monograph. Make any necessary modifications, including concentration of the analyte in the volume of the test solution taken. Use the *Medium* for preparation of the Standard solution and dilution, if necessary, of the test solution.

INTERPRETATION

Pooled Sample—Unless otherwise specified in the individual monograph, the requirements are met if the quantities of the index or marker compound(s) or the extract dissolved from the pooled sample conform to the accompanying acceptance table. The quantity, Q, is the amount of dissolved index or marker compound(s) or the extract specified in the individual monograph, expressed as a percentage of the labeled content. The 5%, 15%, and 25% values in the acceptance table are percentages of the labeled content so that these values and Q are in the same terms.

Acceptance Table for a Pooled Sample

Stage	Number Tested	Acceptance Criteria
S_1	6	Average amount dissolved is not less than Q + 10%
S_2	6	Average amount dissolved (S_1 + S_2) is equal to or greater than Q + 5%
S_3	12	Average amount dissolved (S_1 + S_2 + S_3) is equal to or greater than Q

Dietary Supplements Other Than Vitamin–Mineral and Botanical Dosage Forms

Unless otherwise stated in the individual monographs for dietary supplement dosage forms in this category, compliance requires the testing of 6 individual units, measuring the dissolution of the dietary ingredient as the average of the 6 units tested.

PROCEDURES

Combine equal volumes of the filtered solutions of the 6 specimens withdrawn, and use the pooled sample as the test solution. Determine the average amount of dietary ingredient dissolved in the pooled sample by the *Procedure* specified in the individual monograph. Make any necessary modifications, including concentration of the analyte in the volume of the test solution taken. Use the *Medium* for preparation of the Standard solution and for dilution, if necessary, of the test solution.

TOLERANCES

Because of the diversity of chemical characteristics and solubilities of dietary ingredients pertaining to this category, general tolerances cannot be established. See individual monographs for *Tolerances*.

Exhibit 4

US008158134B1

(12) **United States Patent**
Supersaxo et al.

(10) **Patent No.: US 8,158,134 B1**
(45) **Date of Patent: Apr. 17, 2012**

(54) **MICROEMULSION PRECONCENTRATE, MICROEMULSION AND USE THEREOF**

(75) Inventors: **Andreas Supersaxo**, Baar (CH); **Marc Antoine Weder**, Rüschlikon (CH); **Hans Georg Weder**, Rüschlikon (CH)

(73) Assignee: **Vesifact AG**, Baar (CH)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 1463 days.

(21) Appl. No.: **10/110,212**

(22) PCT Filed: **Oct. 20, 2000**

(86) PCT No.: **PCT/CH00/00569**

§ 371 (c)(1),
(2), (4) Date: **Apr. 19, 2002**

(87) PCT Pub. No.: **WO01/28520**

PCT Pub. Date: **Apr. 26, 2001**

(30) **Foreign Application Priority Data**

Oct. 20, 1999 (CH) 1912/99

(51) **Int. Cl.**
A61K 9/00 (2006.01)
A61K 9/46 (2006.01)
C11D 17/00 (2006.01)

(52) **U.S. Cl.** **424/400**; 424/466; 510/407; 510/421

(58) **Field of Classification Search** 424/439, 424/466, 401; 510/407, 421
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,732,576	A *	3/1988	Friedrich et al.	44/301
5,118,493	A *	6/1992	Kelley et al.	514/11
5,190,748	A *	3/1993	Bachynsky et al.	424/78.08
5,925,684	A *	7/1999	Schweikert et al.	514/458
5,929,030	A *	7/1999	Hamied et al.	514/9
5,932,243	A *	8/1999	Fricker et al.	424/450
5,952,373	A *	9/1999	Lanzendorfer et al.	514/456
5,965,115	A *	10/1999	Bolich et al.	424/70.12
5,968,495	A *	10/1999	Bolich et al.	424/70.12
6,063,762	A *	5/2000	Hong et al.	514/11
6,667,044	B1 *	12/2003	Diec et al.	424/401
6,765,020	B2 *	7/2004	Yoshimura et al.	514/558
2009/0202596	A1 *	8/2009	Pedrani et al.	424/400

FOREIGN PATENT DOCUMENTS

WO	WO 93 18852		9/1993
WO	WO 98/15254	*	4/1998
WO	WO 99 29300		6/1999
WO	WO 99/29316	*	6/1999
WO	WO 99/44642	*	9/1999
WO	WO 99 49848		10/1999
WO	WO-99/56727	*	11/1999
WO	WO 99 56727		11/1999
WO	WO 99/56727	*	11/1999

OTHER PUBLICATIONS

John Klier, "Microemulsions," Standard Article, Kirk-Othmer Encyclopedia of Chemical Technology, copyright 1999-2008, abstract.*
Forster et al. "Influence of microemulsion phases on the preparation of fine disperse emulsions," in Advances in Colloid and Interface Science, vol. 58, No. 2, Jul. 12, 1995, pp. 119-149.*
Devani et al. "The development and charcterisation of triglyceride-based 'spontaneous' multiple emulsions," in International Journal of Pharmaceutics 300 (2005) 76-88.*
Koga et al. "Enhancing mechanism of Labrasol on intestinal membrane permeability of the hydrophilic drug gentamicin sulfate," in the European Journal of Pharmaceutics and Biopharmaceutics, Vo. 64, 2006, pp. 82-91.*

* cited by examiner

Primary Examiner — Blessing Fubara
(74) *Attorney, Agent, or Firm* — Shoemaker and Mattare

(57) **ABSTRACT**

The invention relates to compositions in the form of microemulsion preconcentrates that contain (a) a mixture that consists of a medium-chain triglyceride and an omega-9 fatty acid and/or an omega-6 fatty acid; and (b) a surface-active component that contains a polyoxethylene tenside. When contacted with water or with an aqueous medium these microemulsion preconcentrates form microemulsions. The microemulsions of the O/W type have an average particle size below 150 nm, preferably below 100 nm. The inventive microemulsion preconcentrates and microemulsions are suitable for use as vehicles for substances, namely active agents, that are hardly soluble in water, but soluble in components (a) and/or (b). In the aqueous phase, said microemulsions may contain water-soluble substances.

22 Claims, No Drawings

Exhibit 5

Microemulsion-preconcentrates and microemulsions comprising coenzyme Q10

EP 1249230 B1

IMAGES (1)

Publication number	EP1249230 B1
Publication type	Grant
Application number	EP20010109131
Publication date	Nov 5, 2003
Filing date	Apr 12, 2001
Priority date	Apr 12, 2001
Also published as	CN1256939C, 5 More »
Inventors	Andreas Werner Supersaxo, Hans Georg Weder, Marc Antoine Weder
Applicant	Vesifact Ag
Export Citation	BiBTeX, EndNote, RefMan

Classifications (8), Legal Events (70)

External Links: Espacenet, EP Register

DESCRIPTION translated from German

[0001] The present invention relates to novel formulations in the form of microemulsion preconcentrates and microemulsions, and to their use as a carrier system for poorly soluble active ingredients in water, from the class of ubiquinones, optionally also in combination with vitamins and trace elements. The formulations of the invention are particularly suitable for oral administration in the form of unit dosage forms.

[0002] Ubiquinones can be detected in almost all organisms in large quantities, the only exceptions are Gram-positive and cyanobacteria. Ubiquinones are depending on the number in the side chain of linked isoprene units as Q1, Q2, Q3, etc. referred. They occur preferentially with specific chain lengths, for example in some micro-organisms and yeasts with n = 6 in most mammals, including humans, to outweigh the coenzyme Q10, also known as ubidecarenone. The human body synthesizes some of its coenzyme Q10-demand, and the rest is absorbed by the food. With increasing age, the endogenous production of coenzyme Q10 decreases continuously.

[0003] The multiple effects of coenzyme Q10 are based both on its biological functions in energy metabolism of the cells as well as its antioxidant properties. Due to these effects Coenzyme Q10 is used for the prophylaxis and / or treatment of the following diseases:

Heart and circulatory diseases such as heart attack, angina, atherosclerosis and hypertension
Degenerative diseases of the central nervous system such as Alzheimer's, Parkinson's and depression,
Gum disease
Muscular dystrophy
Male infertility,
boosting the immune system and

to improve exercise capacity. Further, coenzyme Q10 prevent or reduce side effects of certain drugs, or, for example. Those statins such as lovastatin, pravastatin and simvastatin or cytostatic agents such as doxorubicin

[0004] Coenzyme Q10 is a lipophilic (ie hydrophobic) substance with very low solubility in water (practically insoluble). Formulations of Coenzyme Q10, for example, for oral administration are based on the application, therefore, mainly of oils or similar excipients as carrier media. The thus formulated and currently commercially available, preparations for oral administration such as Super Bio-Quinone (Pharma Nord), Bio Coenzyme Q10 (Solanova) and Q-Gel Ultra (Tishcon) have a very low bioavailability.

[0005]

CLAIMS (21)

1. A composition in the form of a microemulsion preconcentrate containing

(a) a mixture comprising a triglyceride and an omega-9-fatty acid and/or an omega-6-fatty acid; and

(b) a surface-active component containing a tenside, in particular of polyoxyethylene type, and

(c) an active substance mixture containing a ubiquinone, preferably Q10, in combination with vitamins, preferably vitamin E and derivatives thereof, and/or trace elements, wherein the ubiquinone is soluble in (a) and/or (b).

2. A composition in the form of a microemulsion which can be obtained by mixing a microemulsion preconcentrate according to claim 1 with water or an aqueous medium.

3. A composition according to claim 1 or claim 2 which is substantially free of components which are miscible with water or soluble in water.

4. A composition according to one of claims 1 to 3 **characterised in that** the fatty acid residues of the triglyceride have 4-18, preferably 6-18 C-atoms.

5. A composition according to claim 4 **characterised in that** the triglyceride is a caprylic/capric acid triglyceride.

6. A composition according to one of claims 1 to 5 **characterised in that** the omega-9-fatty acid and/or the omega-6-fatty acid has 12-14, in particular 16-24, preferably 18-22 C-atoms.

7. A composition according to one of claims 1 to 6 **characterised in that** the omega-9-fatty acid is oleic acid.

8. A composition according to claim 6 or claim 7 **characterised in that** the omega-6-fatty acid is linoleic acid.

9. A composition according to one of claims 1 to 8 **characterised in that** as component (a) it contains a mixture of a caprylic/capric acid triglyceride, oleic acid and/or linoleic acid.

10. A composition according to one of claims 1 to 9 **characterised in that** the quantitative ratio of omega-9-fatty acid and/or omega-6-fatty acid to the glyceride is 1:1 to 1:200, preferably

Kommuru et al. (Int. J. Pharm 212 (2001): 233-246) describe self-emulsifiable systems for administration of coenzyme Q10.

Object of the present invention is to develop a formulation which improves the bioavailability of coenzyme Q10. It has surprisingly been found that when a dosage of formulations based on a microemulsion preconcentrate the oral bioavailability of coenzyme Q10 as compared with the above-mentioned commercially available compounds is significantly higher.

Under the inventive microemulsion preconcentrate a system is understood as follows upon contact with water or other aqueous medium, such as simulated gastric or intestinal juice, for example, when added to water, a microemulsion. In such a microemulsion, it is conventionally accepted sense in a non-opaque or substantially non-opaque colloidal dispersion comprising water and containing organic components, including lipophilic (ie, hydrophobic) components.

Microemulsions according to the invention can be identified by the fact that they have one or more of the following properties:

They are formed spontaneously when their components are brought into contact, so it is this virtually no supply of energy is necessary, and the formation of such microemulsions is therefore without heating or application of a high shearing force or any other substantially mixing.

They are virtually non-opaque, that is transparent or opalescent when viewed under an optical microscope. They are in their undisturbed state, optically isotropic, although at an observation example, using an X-ray technology can determine an anisotropic structure.

They contain a dispersed or particulate (droplet) phase, the particles have a size of less than 200 nm, which originates their optical transparency. The particles may be spherical or have other structures, for example, they may be liquid crystals with lamellar, hexagonal or isotropic symmetry. Generally microemulsions comprise droplets or particles having a maximum dimension, for example, a diameter of less than 150 nm, usually about 10-100 nm

In the inventive microemulsion preconcentrates are accordingly to galenic systems containing a poorly water-soluble therapeutic agent from the class of ubiquinones and when brought into contact with water or

Gastric and intestinal fluids are spontaneously or substantially spontaneously, ie without enabling significant energy input to form a microemulsion.

The invention provides a composition in the form of a microemulsion preconcentrate is containing

(A) a mixture consisting of a triglyceride and an omega-9 fatty acid and / or an omega-6 fatty acid, and

(B) a surfactant component comprising a surfactant, in particular of polyoxyethylene type,

(C) an active substance mixture containing a ubiquinone, preferably Q10,. In combination with vitamins, preferably vitamin E and derivatives thereof, and / or trace elements, wherein the ubiquinone in (a) and / or (b) is releasably

- The invention relates to effervescent tablets and granules and containing a composition in the form of a microemulsion preconcentrate containing
- (A) a mixture consisting of a triglyceride and an omega-9 fatty acid and / or an omega-6 fatty acid, and
- (B) a surfactant component comprising a surfactant, in particular of polyoxyethylene type,
- (C) an active ingredient selected from the class of ubiquinones, wherein the active agent in (a) and / or (b) is soluble.
- The inventive microemulsion preconcentrates are preferably characterized in that they
- (A), a mixture consisting of a medium chain triglyceride and an omega-9 fatty acid and / or an omega-6 fatty acid
- (B) a surfactant component comprising a surfactant include polyoxyethylene type and
- (C) a sparingly water-soluble, in component (a) and / or (b), however, soluble therapeutic agent from the class of ubiquinones included.
- The ratio of the components (a): (b): (c), (a): (c) or (b): (c) of the novel microemulsion must be chosen, of course, so that the active compound (c) is solubilized stable ie it may not occur for several weeks precipitates.

1:2 to 1:20.

11. A composition according to one of claims 1 to 10 **characterised in that** the surface-active component (b) is a polyoxyethylene sorbitan fatty acid ester, a polyoxyethylene-glycolated natural or hydrated vegetable oil or mixtures thereof.

12. A composition according to one of claims 1 and 3 to 11 **characterised in that** the component (a) is present in an amount of 20 to 70 percent by weight with respect to the total weight of the composition.

13. A composition according to one of claims 1 and 3 to 12 **characterised in that** the surface-active component (b) is present in an amount of 20 to 80 percent by weight with respect to the total weight of the composition.

14. A composition according to one of claims 2 to 13 **characterised in that** it is an O/W-microemulsion with an average particle size of less than 150 nm, preferably less than 100 nm.

15. A shaped body for oral administration containing a composition according to one of claims 1 and 3 to 13 for administering the active substance.

16. , A shaped body according to claim 15 **characterised in that** it contains a biopolymer, in particular gelatin.

17. An effervescent tablet containing a composition according to one of claims 1 and 3 to 13 for administering the active substance.

18. A granular material containing a composition according to one of claims 1 and 3 to 13 for administering the active substance.

19. An effervescent tablet containing a composition in the form of a microemulsion preconcentrate containing

(a) a mixture comprising a triglyceride and an omega-9-fatty acid and/or an omega-6-fatty acid; and

(b) a surface-active component containing a tenside, in particular of polyoxyethylene type, and

(c) an active substance selected from the class of ubiquinones, wherein the active substance is soluble in (a) and/or (b).

20. A granular material containing a composition in the form of a microemulsion preconcentrate containing

(a) a mixture comprising a triglyceride and an omega-9-fatty acid and/or an omega-6-fatty acid; and

(b) a surface-active component containing a tenside, in particular of polyoxyethylene type, and

(c) an active substance selected from the class of ubiquinones, wherein the active substance is soluble in (a) and/or (b).

21. Use of a shaped body, granular material or effervescent tablet according to one of claims 15 to 20 which break down in the gastrointestinal tract, for producing a medicament for release of a composition spontaneously forming a microemulsion with gastrointestinal juice.

- In contrast to the formulations of the prior art, the microemulsion preconcentrates of the present invention is substantially free of components with water-miscible or soluble in water. This is in particular the components
    - $C_{1-C\,5}$ alkyl or tetrahydrofurfuryl diethers or partial ethers of low molecular weight mono-or polyoxy-$C_{2-C\,12}$ alkanediols;
    - 1,2-propylene glycol;
    - lower alkanols;
    - Esterification products of polycarboxylic acids with 2-10, especially 3-5 carboxyl groups with $C_{1-C\,10}$ alcohols, and
    - Esterification products of polyols with 2-10, especially 3-5 carboxyl groups with $C_{2-C\,11\text{-carboxylic}}$ acids;

  in particular substantially free from diethylene glycol monomethyl ether, glycofurol, 1,2-propylene glycol, triethyl citrate, Tributycitrat, Acetyltributycitrat, acetyl citrate, triacetin, ethanol, polyethylene glycol, and propylene carbonate dimethylisosorbitol.
- In contrast to the relevant formulations according to WO 98/40051 A component (a) of the inventive microemulsion preconcentrate, in addition to a medium chain triglyceride, an omega-9 fatty acid and / or an omega-6 fatty acid, which surprisingly have a particularly pronounced stability novel microemulsions is connected, which is for their therapeutic usefulness is crucial.
- The inventive microemulsion preconcentrates may be prepared by mixing the individual components, optionally with heating, intimately mixed together. The microemulsion preconcentrates may also be prepared by dissolving the component (b), with stirring, optionally under heating, in the component (a), and the resulting solution was added with further stirring with the component (c). Here, it is of particular importance in that the component or the active ingredient (c) in either component (a) or component (b) or in both components (a) and (b) is releasable and that the manufacture of the pre-concentrate, ie the mixture of all three components (a), (b) and (c) the active substance is present in any case remain in dissolved form.
- As component (a) mixtures are of a medium chain fatty acid, advantageously a fatty acid triglyceride in which the fatty acid residues 4 to 18, preferably 6 to 18 carbon atoms, and an omega-9 and / or an omega-6 fatty acid. These substances are not miscible with water and insoluble in water and practically insoluble and have no or virtually no surfactant function.
- Preferred medium chain fatty acid triglycerides are Capryl-/Caprinsäure-Triglyceride as they are available, for example under the trade name MIGLYOL known and commercially (Fiedler, Lexikon der excipients, 3rd Edition, pages 808-809, 1989). They include the following products:
  MIGLYOL 810, 812 and 818
- It is a fractionated coconut oil which contains triglycerides of caprylic and capric acid, and a molecular weight of about 520 (MIGLYOL 810 and 812) and 510 has (MIGLYOL 818). It has a fatty acid composition of C_6 of maximum 2 percent (MIGLYOL 810) and 3 percent (MIGLYOL 812 and 818), with C_8 from about 65 to 75 percent (MIGLYOL 810), 50 to 65 percent (MIGLYOL 812) and 45 to 60 percent (MIGLYOL 818). C_{10} is at 25 to 35 percent with MIGLYOL in MIGLYOL 812 with about 30 to 45 percent, and MIGLYOL 818 represented about 25 to 40 percent C_{12} with a maximum of 2 percent (MIGLYOL 810), 5 percent (MIGLYOL 812), and 2 to 5 percent (MIGLYOL 818). MIGLYOL 818 additionally has a content of $C_{18:2}$ of about 4 to 6 percent.
- Further, triglycerides of caprylic and capric acids are suitable, as they are known under the trade name MYRITOL and are available (Fiedler, Lexikon der excipients, 3rd Edition, page 834, 1989). These include for example the product 813th MYRITOL
- Other suitable products of this class are CAPTEX 355, CAPTEX 300, CAPTEX 800, CAPMUL MCT, NEOBEE M5 and Mazol 1400th
- Suitable omega-9 fatty acids are mainly those having 12-24, in particular 16-24, preferably 18-22 carbon atoms, such as oleic acid and eicosatrienoic. Particularly preferred is the oleic acid.
- Suitable omega-6 fatty acids are mainly those with 12-24, in particular 16-24, preferably 18-22 carbon atoms, for example, linoleic acid, gamma-linolenic acid, dihommo-gamma-linolenic acid and arachidonic acid. Particularly preferred is the linoleic acid.
- In a particularly preferred embodiment is used as the component (a) a mixture consisting of one Capryl-/Caprinsäure-Triglycerid, oleic acid and / or linoleic acid.
- Component (c), which are sparingly soluble in water, in the component (a) and / or (b), however, soluble therapeutic agent from the class of ubiquinones, preferably coenzyme Q10, though it may also be another suitable ubiquinone, optionally in combination with vitamins , preferably vitamin E, and / or trace elements may be used.
- Wherein component (b), the surface-active component containing a tenside of polyoxyethylene type, it may be a hydrophilic surfactant or a lipophilic surfactant, but also mixtures of such agents come into question.
- Examples of such surfactants are as follows:
    - Reaction products of natural or hydrogenated vegetable oils and ethylene glycol, namely polyoxyethylene glycolated natural or hydrogenated vegetable oils such as polyoxyethylene glycolated natural or hydrogenated castor oils. Especially useful are the various surfactants known as Cremophor and are available (Fiedler, Lexikon der excipients, 3rd edition, pages 326 to 327, 1989), especially those products with the names Cremophor RH 40, Cremophor RH 60 and Cremophor EL. Also suitable for use as such products, the various surfactants sold under the name NIKKOL known and available, for example, NIKKOL HCO-60.
    - Polyoxyethylene, such as the mono-and Trilaurylester, the mono-and Tripalmitylester, the mono-and Tristearylester and the mono-and Trioleylester as under the name TWEEN are known and available (Fiedler, Lexikon der excipients, 3rd Edition, pages 1300 to 1304, 1989), for example, the products
      Tween 20: polyoxyethylene (20) sorbitan,
      TWEEN 40: polyoxyethylene sorbitan monopalmitate (20)
      TWEEN 60: polyoxyethylene sorbitan monostearate (20)
      TWEEN 80: Polyoxyethylene sorbitan monooleate (20),
      TWEEN 65: polyoxyethylene sorbitan (20),
      TWEEN 85: polyoxyethylene (20) sorbitan,
      TWEEN 21: Polyoxyethylene sorbitan monolaurate (4),
      TWEEN 61: polyoxyethylene sorbitan monostearate (4) and
      TWEEN 81: Polyoxyethylene sorbitan monooleate (4).

- Particularly preferred from this class of compounds is TWEEN 80
    - Polyoxyethylene fatty acid esters, such as those commercially available under the name MYRJ known and available Polyoxyethylenstearinsäureester (Fiedler, Lexikon der excipients, 3rd Edition, page 834, 1989), especially the product MYRJ 52, and also under the name CETIOL HE known and available polyoxyethylene (Fiedler Encyclopedia of excipients, 3rd edition, page 284, 1989).
    - Copolymers of polyoxyethylene and polyoxypropylene like. Example, under the names Pluronic and EM Kalyx are known and available (Fiedler, Lexikon der excipients, 3rd Edition, pages 956-958, 1989), especially the product Pluronic F68
    - Block copolymers of polyoxyethylene and polyoxypropylene, as for example under the name POLOXAMER are known and available (Fiedler, Lexikon der excipients, 3rd Edition, page 959, 1989), especially the product POLOXAMER 188th
    - Polyethoxylated vitamin E derivatives, in particular the product Vitamin E TPGS (d-alpha Tocoperyl Polyethylene Glycol 1000 Succinate, Eastman).
    - Polyethoxylated hydroxyfatty, especially the product Solutol HS 15 (polyoxyethylene-660-hydroxystearate, BASF).
    - Transesterification of natural Pflanzenölglyceriden and Polyethylenpolyolen. These include transesterification of different, for example, non-hydrogenated, vegetable oils such as corn oil, pumpkin seed oil, almond oil, peanut oil, olive oil and palm oil, and mixtures thereof with polyethylene glycols, in particular those which have an average molecular weight of 200-800. Several such transesterification are known as LABRAFIL known and available (Fiedler, Lexikon der excipients, 3rd edition, page 707, 1989), of which the products Labrafil M 1944 CS and Labrafil M 2130 CS particularly suitable.

- Ethylene oxide adducts of sterols and derivatives thereof, thereof, for example, cholesterol and derivatives, such as products which are derived from sitosterol, campesterol or stigmasterol, for example Sojasterolen and derivatives thereof (Fiedler, Lexikon der Hilfsstoffe, 3rd edition, pages 554 and 555, 1989), as they are known and are available under the designations Generol, are in particular the products Generol 122 E5, 122 E10, and 122 E25.
- The inventive microemulsion preconcentrates comprise both systems which contain a single surfactant, as well as systems that contain a mixture of two or more surfactants, eg Tween 80 + CREMOPHOR RH 40, TWEEN 80 + CREMOPHOR RH 40 + VITAMIN E TPGS etc .
- According to the invention is preferably used, a surface-active component containing a polyoxyethylene, a polyoxyethylene glycolated natural or hydrogenated vegetable oil or mixtures thereof.
- The inventive microemulsion preconcentrates may also contain other substances, such as antioxidants, thickeners, fragrances and / or flavoring agents, coloring agents, etc.
- The inventive pre-microemulsions are primarily intended for oral use. Preference is given the so-called A unit dosage form, ie, the microemulsion preconcentrate is in a molded body such as a soft or hard capsule as spent from gelatin or starch. Containing the active ingredient if the pre-microemulsion is released forms spontaneously in conjunction with gastrointestinal fluid, a microemulsion. Compositions of the invention prove to be suitable for oral administration in the form of Einheitsdosisformem also therefore be particularly suitable, because the addition of volatile organic solvents, in particular from ethanol commonly used is not required. The use of the said solvents is adversely affected by its evaporation through the outer wall of the shaped body, in particular of soft or hard gelatin capsule, the storability and the active ingredient crystallizes. The occurrence of these adverse effects should be avoided by expensive measures in packing and storage.
- The new compositions can also be processed into effervescent tablets or granules.
- A unit dosage form of the above-described type contains advantageously 0.5 to 25, preferably 10-20 weight percent of a sparingly soluble in water, in the component (a) and / or (b), however, soluble therapeutic agent of the class of ubiquinones (component (c)), 9.5 to 70, preferably 20 to 70 weight percent and more preferably 25 to 65 weight percent of a mixture consisting of a medium chain triglyceride and an omega-9 fatty acid and / or an omega-6 fatty acid (component (a)) and 20 to 90, preferably 25 to 65 weight percent of the surface-active component (b).
- By the present invention can also be pharmaceutical compositions provide, the sparingly soluble one in water, present in component (a), but soluble therapeutic agent from the class of ubiquinones and representing itself microemulsions; these microemulsions is the active ingredient solubilized stable with several weeks, no precipitates are observed. For oral administration may be microemulsions, obtained for example by diluting the inventive microemulsion preconcentrates with water or an aqueous medium, can be directly used as drinking formulations. Is a parenteral application is provided, then include compositions in which other excipients may be present, also water, so that an aqueous microemulsion in the form of an injection solution, an infusion solution or the like is obtained.
- Such pharmaceutical compositions in the form of microemulsions are also new and object of the present invention.
- The novel micro-emulsions can be produced from the novel microemulsion preconcentrates by dilution with water or other aqueous liquids. When contacting the pre-concentrate with water or stomach and intestinal juice is spontaneously or substantially spontaneously, ie without significant energy input a microemulsion formed.
- Depending on the amount of water present is W / O microemulsions, to bicontinuous microemulsions or O / W microemulsions.
- The novel microemulsions of the O / W type (oil-in-water) exhibit stability properties, such as they have been described above in connection with micro-emulsions, that is, in particular, that in these microemulsions of the active agent is solubilized stable over several weeks no precipitate can be observed. The particle size of these microemulsions is less than 150 nm, preferably less than 100 nm by the following examples compositions of the invention are explained further. Examples 1.1 to 3.1 show the preparation of compositions in oral unit dosage forms of, for example, for the prevention or treatment of heart and circulatory diseases, degenerative diseases of the central nervous system, gum disease, muscular dystrophy, male infertility, to strengthen the immune system, improve physical performance and for preventing or reducing side effects of statin-induced suitable. Example 2.1 demonstrates the preparation of a composition for parenteral application. In Example 3, the oral bioavailability of a composition of the invention is determined and compared with those of commercially available compounds.
- The examples are described with particular reference to coenzyme Q10. Using other appropriate Ubiquinone, optionally in combination with vitamins, preferably vitamin E and / or trace elements may be produced, however, similar compositions.

  Example 1: Preparation of oral coenzyme Q10 dosage forms of the type microemulsion preconcentrate Example 1.1
- Coenzyme Q10 (c1) 10.00%
  Miglyol 812 (a1) 38.90%
  Oleic acid (a2) 6.00%
  Tween 80 (b) 45.00%
  Vitamin E (c2) 0.10%

  The coenzyme Q10 (c1) is introduced with stirring at 40 - 45 ° C dissolved in the components (a1), (a2), (b) and (c2). The formed microemulsion preconcentrate is filled into a soft or hard gelatin capsule or made into effervescent tablets.
- Alternatively, the microemulsion preconcentrate also be filled into a dispenser. In this case the patient is by appropriate dilution with water or another aqueous liquid from the microemulsion preconcentrate forth an oral drink solution of the type O / W microemulsion.
- In a similar manner can also be prepared the following compositions.

  Reference Example 1.2
- Coenzyme Q10 (c) 10.00%
  Miglyol 812 (a1) 35.00%
  Oleic acid (a2) 10.00%
  Tween 80 (b1) 33.75%
  Cremophor EL (b2) 11.25%

  Reference Example 1.3
- Coenzyme Q10 (c) 20.00%
  Miglyol 812 (a1) 25.00%
  Oleic acid (a2) 10.00%
  Tween 80 (b1) 33.75%
  Cremophor EL (b2) 11.25%
- Compositions of the above type can be diluted with water, for example at 1:10, arise microemulsions, the following particle sizes have (see Table 1):

  Composition microemulsion preconcentrate O / w microemulsion

	Particle diameter [Nm]	Standard deviation [1] [nm]
Example 1.1	35.7	2.14
Example 1.2	6.26	9.8
Example 1.3	28.0	6.10

- The table below shows that the microemulsion formation of microemulsion preconcentrates unchanged after filling and storage in soft gelatin capsules (WHC) remains.

Microemulsion preconcentrate Example 1.1	Particle diameter of the coenzyme Q10 microemulsion	
	Gastric juice [nm]	Intestinal juice [nm]
Before filling in WHC	41.9 ± 18.1	39.0 ± 16.1

After filling in WHC	41.5 ± 18.9	37.8 ± 19.5
After 1 month of storage narrowing in WHC at 25 ° C and 60% RH	45.2 ± 17.9	40.6 ± 16.8
After 1 month of storage narrowing in WHC at 40 ° C and 75% RH	44.9 ± 20.2	39.5 ± 17.3
After 3-month storage narrowing in WHC at 25 ° C and 60% RH	43.0 ± 17.6	39.4 ± 17.1

Example 2: Preparation parenterally applicable CoQ10 forms of type microemulsion

- The described in Example 1.1 to 1.3 microemulsion preconcentrates can serve as the basis for the production of injection or infusion solutions by being with other additives, such as normal saline or 5% glucose solution and the like, diluted accordingly.
- Example 2.1: Coenzyme Q10 0.10% infusion
  Microemulsion preconcentrate according to Example 1.2 1.00%
  5% glucose solution to 100.00%
- The liquid microemulsion preconcentrate is added under stirring at room temperature of the glucose solution. The resulting coenzyme Q10 O / W microemulsion is 0.2 micron sterile filtered and filled into sterile containers common.

Example 3: bioavailability of coenzyme Q10 microemulsion preconcentrate according to Example 1.1 commercially after oral administration in soft gelatin capsule, compared with three available preparations

- The aim of this four-arm, double-blind, randomized study of 20 subjects of both sexes was to examine the plasma concentration of CoQ10 after a single oral dose of 120 mg. Given intermittently for 24 hours blood samples were taken.

Preparations

- A
  Soft gelatin capsules containing coenzyme Q10
  Microemulsion preconcentrate according to Example 1.1
  Lot 201004
  Active ingredient: 30 mg CoQ10 per capsule
- B
  Q-Gel Ultra (Tishcon)
  Batch 19710060
  Active ingredient: 60 mg CoQ10 per capsule
- C
  Super Bio-Quinone (Pharma Nord)
  Lot 000956
  Active ingredient: 30 mg CoQ10 per capsule
- D
  Bio Coenzyme Q10 (Solanova)
  Batch 00310050
  Active ingredient: 30 mg CoQ10 per capsule

Dosage

- Coenzyme Q10 120 mg orally in 2 or 4 capsules

Taking

- The oral intake of 120 mg Coenmzym Q10 was sober, the morning before breakfast

Volunteers

- n = 20 in 4 groups of 5 subjects (A - D)

Measurement parameters

- Plasma levels of coenzyme Q10 [ug / ml plasma]
  Analysis of plasma samples
- The quantitative determination of coenzyme Q10 (ubidecarenone) using HPLC

Devices	HPLC unit MERCK / HITACHI, UV detection, autosamplers F. Beckmann (Spectra Physics)
Column	Nucleosil RP 18 (5µm), 15 cm long, 4 mm diameter, Merck
Eluent	Acetonitrile
Injection loops	100/20 mu.l
UV detector	275 nm
Retention time	10 min
Detection limit	80 ng / ml

Results

- The plasma levels of the compounds A - D show significant differences in terms of reaching the maximum and the permeation rate (see Figure 1). The calculation of the AUC and the derived relative dose available, based on 120 mg single dose, can be significant differences in the bioavailability of coenzyme Q10 after a single oral administration clearly describe. Composition of the invention (test preparation A) is compared to the test specimens B, C and D is a 3-5 fold higher bioavailability (Vg Table 3).

Test preparation	A	B	C	D
AUC [µg/ml/10h]	30.16	5.72	5.14	10.65
Relative available dose based on 120 mg single dose	75.39	14:30	12.86	26.63

CLASSIFICATIONS

International Classification	A61K9/107, A61K31/122, A61K9/48
Cooperative Classification	A61K9/1075, A61K31/122, A61K9/4858
European Classification	A61K9/107D, A61K31/122

LEGAL EVENTS

Date	Code	Event	Description
Aug 30, 2013	PGFP	Postgrant: annual fees paid to national office	**Ref country code:** FR **Payment date:** 20130625

Date	Code	Event	Description
			Payment date: 20130423 **Ref country code:** IT **Ref country code:** FI **Payment date:** 20130410 **Year of fee payment:** 13 **Ref country code:** NL **Ref country code:** PT **Payment date:** 20130405
Jul 31, 2013	PGFP	Postgrant: annual fees paid to national office	**Payment date:** 20130415 **Ref country code:** BE **Ref country code:** CH **Payment date:** 20130627 **Ref country code:** DE **Year of fee payment:** 13 **Payment date:** 20130508 **Ref country code:** GB **Ref country code:** SE **Payment date:** 20130412 **Payment date:** 20130410 **Ref country code:** IE **Ref country code:** DK
May 31, 2013	PGFP	Postgrant: annual fees paid to national office	**Ref country code:** GR **Payment date:** 20130329 **Year of fee payment:** 13
Mar 29, 2013	PGFP	Postgrant: annual fees paid to national office	**Payment date:** 20120327 **Ref country code:** AT **Year of fee payment:** 12
Jan 31, 2013	PGFP	Postgrant: annual fees paid to national office	**Ref country code:** PT **Year of fee payment:** 12 **Payment date:** 20120411
Dec 31, 2012	PGFP	Postgrant: annual fees paid to national office	**Ref country code:** ES **Year of fee payment:** 12 **Payment date:** 20120510
Sep 28, 2012	PGFP	Postgrant: annual fees paid to national office	**Payment date:** 20120420 **Ref country code:** IT **Year of fee payment:** 12
Aug 31, 2012	PGFP	Postgrant: annual fees paid to national office	**Year of fee payment:** 12 **Ref country code:** FI **Ref country code:** SE **Payment date:** 20120411 **Ref country code:** GB **Ref country code:** FR **Payment date:** 20120504
Jul 31, 2012	PGFP	Postgrant: annual fees paid to national office	**Year of fee payment:** 12 **Payment date:** 20120412 **Ref country code:** BE **Ref country code:** DE **Payment date:** 20120425 **Ref country code:** NL **Payment date:** 20120413 **Ref country code:** IE **Payment date:** 20120411 **Ref country code:** DK
Jun 29, 2012	PGFP	Postgrant: annual fees paid to national office	**Year of fee payment:** 12 **Payment date:** 20120330 **Ref country code:** GR
Sep 30, 2011	PGFP	Postgrant: annual fees paid to national office	**Payment date:** 20110415 **Year of fee payment:** 11 **Ref country code:** IT

Date	Code	Event	Description
Aug 31, 2011	PGFP	Postgrant: annual fees paid to national office	**Payment date:** 20110406 **Ref country code:** GB **Year of fee payment:** 11 **Year of fee payment:** 11 **Payment date:** 20110420 **Ref country code:** NL **Payment date:** 20110412 **Ref country code:** DK **Ref country code:** AT **Payment date:** 20110328 **Ref country code:** BE **Payment date:** 20110411 **Payment date:** 20110412 **Ref country code:** FI **Year of fee payment:** 11
Jul 29, 2011	PGFP	Postgrant: annual fees paid to national office	**Year of fee payment:** 11 **Ref country code:** IE **Payment date:** 20110406 **Ref country code:** DE **Year of fee payment:** 11 **Ref country code:** SE **Payment date:** 20110412 **Ref country code:** PT **Payment date:** 20110426 **Ref country code:** FR **Ref country code:** CH **Payment date:** 20110630 **Ref country code:** ES **Payment date:** 20110518 **Year of fee payment:** 11
Jun 30, 2011	PGFP	Postgrant: annual fees paid to national office	**Ref country code:** GR **Year of fee payment:** 11 **Payment date:** 20110328
Dec 31, 2010	PGFP	Postgrant: annual fees paid to national office	**Ref country code:** GR **Payment date:** 20100331 **Year of fee payment:** 10
Nov 30, 2010	PGFP	Postgrant: annual fees paid to national office	**Payment date:** 20100409 **Ref country code:** SE **Year of fee payment:** 10
Oct 29, 2010	PGFP	Postgrant: annual fees paid to national office	**Ref country code:** CH **Payment date:** 20100629 **Payment date:** 20100423 **Year of fee payment:** 10 **Ref country code:** BE
Aug 31, 2010	PGFP	Postgrant: annual fees paid to national office	**Ref country code:** AT **Payment date:** 20100413 **Ref country code:** DE **Payment date:** 20100430 **Ref country code:** IT **Payment date:** 20100417 **Year of fee payment:** 10 **Ref country code:** NL **Payment date:** 20100402 **Year of fee payment:** 10
Jul 30, 2010	PGFP	Postgrant: annual fees paid to national office	**Ref country code:** DK **Payment date:** 20100412 **Ref country code:** ES **Payment date:** 20100505 **Year of fee payment:** 10 **Ref country code:** FI **Payment date:** 20100414

Date	Code	Event	Description
			Year of fee payment: 10 **Ref country code:** FR **Payment date:** 20100521 **Ref country code:** IE **Payment date:** 20100416 **Ref country code:** PT **Payment date:** 20100331
Jun 30, 2010	PGFP	Postgrant: annual fees paid to national office	**Ref country code:** GB **Payment date:** 20100325 **Year of fee payment:** 10
Nov 30, 2009	PGFP	Postgrant: annual fees paid to national office	**Ref country code:** GB **Payment date:** 20090408 **Year of fee payment:** 09
Oct 30, 2009	PGFP	Postgrant: annual fees paid to national office	**Ref country code:** CH **Payment date:** 20090630 **Year of fee payment:** 09
Sep 30, 2009	PGFP	Postgrant: annual fees paid to national office	**Ref country code:** BE **Payment date:** 20090422 **Year of fee payment:** 09
Aug 31, 2009	PGFP	Postgrant: annual fees paid to national office	**Ref country code:** AT **Payment date:** 20090415 **Ref country code:** DE **Payment date:** 20090409 **Ref country code:** FI **Payment date:** 20090416 **Ref country code:** FR **Payment date:** 20090417 **Year of fee payment:** 09 **Ref country code:** IT **Payment date:** 20090421 **Ref country code:** NL **Payment date:** 20090405 **Ref country code:** PT **Payment date:** 20090408 **Ref country code:** SE **Payment date:** 20090407
Jul 31, 2009	PGFP	Postgrant: annual fees paid to national office	**Ref country code:** DK **Payment date:** 20090415 **Year of fee payment:** 09 **Ref country code:** ES **Payment date:** 20090508 **Ref country code:** IE **Payment date:** 20090420
Jun 30, 2009	PGFP	Postgrant: annual fees paid to national office	**Ref country code:** GR **Payment date:** 20090330 **Year of fee payment:** 09
Feb 27, 2009	PGFP	Postgrant: annual fees paid to national office	**Ref country code:** GR **Payment date:** 20080313 **Year of fee payment:** 08
Dec 31, 2008	PGFP	Postgrant: annual fees paid to national office	**Ref country code:** GB **Payment date:** 20080416 **Year of fee payment:** 08
Oct 31, 2008	PGFP	Postgrant: annual fees paid to national office	**Ref country code:** CH **Payment date:** 20080702 **Ref country code:** IE **Payment date:** 20080415 **Ref country code:** NL **Payment date:** 20080403 **Year of fee payment:** 08 **Ref country code:** SE

Date	Code	Event	Description
			Payment date: 20080408
Sep 30, 2008	PGFP	Postgrant: annual fees paid to national office	**Ref country code:** BE **Payment date:** 20080616 **Ref country code:** FI **Payment date:** 20080411 **Year of fee payment:** 08 **Ref country code:** IT **Payment date:** 20080428
Aug 29, 2008	PGFP	Postgrant: annual fees paid to national office	**Ref country code:** AT **Payment date:** 20080410 **Year of fee payment:** 08
Jul 31, 2008	PGFP	Postgrant: annual fees paid to national office	**Ref country code:** DE **Payment date:** 20080417 **Ref country code:** DK **Payment date:** 20080430 **Ref country code:** ES **Payment date:** 20080520 **Year of fee payment:** 08 **Ref country code:** FR **Payment date:** 20080312
May 30, 2008	PGFP	Postgrant: annual fees paid to national office	**Ref country code:** GR **Payment date:** 20070402 **Year of fee payment:** 07 **Ref country code:** PT **Payment date:** 20080328 **Year of fee payment:** 08
Apr 30, 2008	PGFP	Postgrant: annual fees paid to national office	**Ref country code:** FR **Payment date:** 20070411 **Year of fee payment:** 07
Jan 2, 2008	PGFP	Postgrant: annual fees paid to national office	**Ref country code:** IT **Payment date:** 20070515 **Year of fee payment:** 07
Nov 24, 2007	PGFP	Postgrant: annual fees paid to national office	**Ref country code:** CH **Payment date:** 20070702 **Year of fee payment:** 07 **Ref country code:** GB **Payment date:** 20070411
Jun 15, 2007	PGFP	Postgrant: annual fees paid to national office	**Ref country code:** BE **Payment date:** 20070615 **Year of fee payment:** 07
May 21, 2007	PGFP	Postgrant: annual fees paid to national office	**Ref country code:** ES **Payment date:** 20070521 **Year of fee payment:** 07
Apr 16, 2007	PGFP	Postgrant: annual fees paid to national office	**Ref country code:** DK **Payment date:** 20070416 **Year of fee payment:** 07
Apr 13, 2007	PGFP	Postgrant: annual fees paid to national office	**Ref country code:** FI **Payment date:** 20070413 **Year of fee payment:** 07
Apr 12, 2007	PGFP	Postgrant: annual fees paid to national office	**Ref country code:** AT **Payment date:** 20070412 **Year of fee payment:** 07 **Ref country code:** IE
Apr 5, 2007	PGFP	Postgrant: annual fees paid to national office	**Ref country code:** DE **Payment date:** 20070405 **Year of fee payment:** 07
Apr 4, 2007	PGFP	Postgrant: annual fees paid to national office	**Ref country code:** SE **Payment date:** 20070404 **Year of fee payment:** 07

Date	Code	Event	Description
Apr 3, 2007	PGFP	Postgrant: annual fees paid to national office	**Ref country code:** NL **Payment date:** 20070403 **Year of fee payment:** 07
Mar 28, 2007	PGFP	Postgrant: annual fees paid to national office	**Ref country code:** PT **Payment date:** 20070328 **Year of fee payment:** 07
Jun 28, 2006	PGFP	Postgrant: annual fees paid to national office	**Ref country code:** CH **Payment date:** 20060628 **Year of fee payment:** 06
Apr 30, 2006	PGFP	Postgrant: annual fees paid to national office	**Ref country code:** IT **Payment date:** 20060430 **Year of fee payment:** 06
Apr 12, 2006	PGFP	Postgrant: annual fees paid to national office	**Ref country code:** GB **Payment date:** 20060412 **Year of fee payment:** 06
Apr 10, 2006	PGFP	Postgrant: annual fees paid to national office	**Ref country code:** FR **Payment date:** 20060410 **Year of fee payment:** 06
Mar 29, 2006	PGFP	Postgrant: annual fees paid to national office	**Ref country code:** GR **Payment date:** 20060329 **Year of fee payment:** 06
Oct 27, 2004	26N	No opposition filed	**Effective date:** 20040806
Jul 30, 2004	ET	Fr: translation filed	
Jul 1, 2004	REG	Reference to a national code	**Ref country code:** ES **Ref legal event code:** FG2A **Ref document number:** 2210056 **Kind code of ref document:** T3
Apr 30, 2004	PG25	Lapsed in a contracting state announced via postgrant inform. from nat. office to epo	**Ref country code:** MC **Free format text:** LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES **Effective date:** 20040430
Apr 12, 2004	PG25	Lapsed in a contracting state announced via postgrant inform. from nat. office to epo	**Ref country code:** LU **Free format text:** LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES **Effective date:** 20040412
Mar 31, 2004	REG	Reference to a national code	**Ref country code:** PT **Ref legal event code:** SC4A **Free format text:** AVAILABILITY OF NATIONAL TRANSLATION **Effective date:** 20040204
Mar 15, 2004	REG	Reference to a national code	**Ref country code:** DK **Ref legal event code:** T3
Feb 10, 2004	REG	Reference to a national code	**Ref country code:** SE **Ref legal event code:** TRGR
Feb 4, 2004	GBT	Gb: translation of ep patent filed (gb section 77(6)(a)/1977)	**Effective date:** 20040108
Dec 31, 2003	REG	Reference to a national code	**Ref country code:** IE **Ref legal event code:** FG4D **Free format text:** GERMAN
Dec 11, 2003	REF	Corresponds to:	**Ref document number:** 50100901 **Country of ref document:** DE **Date of ref document:** 20031211 **Kind code of ref document:** P
Nov 28, 2003	REG	Reference to a national code	**Ref country code:** CH **Ref legal event code:** NV **Representative=s name:** HANS RUDOLF GACHNANG PATENTANWALT
Nov 14, 2003	REG	Reference to a national code	**Ref country code:** CH **Ref legal event code:** EP

Date	Code	Event	Description
Nov 5, 2003	REG	Reference to a national code	**Ref country code:** GB **Ref legal event code:** FG4D **Free format text:** NOT ENGLISH
Nov 5, 2003	AK	Designated contracting states:	**Kind code of ref document:** B1 **Designated state(s):** AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE TR
Nov 5, 2003	PG25	Lapsed in a contracting state announced via postgrant inform. from nat. office to epo	**Ref country code:** CY **Free format text:** LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT **Effective date:** 20031105 **Ref country code:** TR
Jul 9, 2003	AKX	Payment of designation fees	**Designated state(s):** AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE TR
Oct 16, 2002	AX	Extension or validation of the european patent to	**Free format text:** AL;LT;LV;MK;RO;SI
Oct 16, 2002	AK	Designated contracting states:	**Kind code of ref document:** A1 **Designated state(s):** AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE TR
Oct 16, 2002	17P	Request for examination filed	**Effective date:** 20020228

Exhibit 6

ORIGINAL RESEARCH

RELATIVE BIOAVAILABILITY COMPARISON OF DIFFERENT COENZYME Q_{10} FORMULATIONS WITH A NOVEL DELIVERY SYSTEM

Zheng-Xian Liu, PhD; Carl Artmann, PhD

Commercial coenzyme Q_{10} (CoQ_{10}, ubiquinone) formulations are often of poor intestinal absorption. The relative bioavailability of CoQ_{10} has been shown in National Institutes of Health–funded clinical trials to be increased by its delivery system. We investigated the bioavailability of a new CoQ_{10} formulation based on a new and patented technology, VESIsorb, with 3 other commercially available CoQ_{10} products, an oil-based formulation and 2 solubilizates. This new CoQ_{10} formulation (commercially branded CoQsource) is a lipid-based formulation that naturally self-assembles on contact with an aqueous phase into an association colloid delivery system (hereafter "colloidal-Q_{10}"). Twenty healthy male and female subjects participated in a double blind, comparative (parallel design), controlled, single-dose (120 mg) bioavailability study. Plasma concentration of CoQ_{10} was determined at baseline and at various intervals after administration over a 24-hour period. To compare bioavailability, maximum concentration (C_{max}) and area under curve from 0 to >10 hours ($AUC_{(0\text{-}10h)}$) were assessed. The kinetic profiles of all CoQ_{10} preparations revealed a 1-peak plasma concentration-time course. Highest C_{max} values were seen after colloidal-Q_{10} administration. Colloidal-Q_{10} not only had the highest plasma concentration levels after 1 hour, but it continued to increase before reaching C_{max} at about 4 hours. The plasma concentration of colloidal-Q_{10} remained well above the levels of the 3 other products throughout the 24-hour period. The relative bioavailability calculated using the $AUC_{(0\text{-}10h)}$ values was also the highest for colloidal-Q_{10}; the $AUC_{(0\text{-}10h)}$ values were 30.6, 6.1, 4.9 and 10.7 µg/ml*h for colloidal-Q_{10}, solubilizate 1, the oil-based formulation, and solubilizate 2, respectively. Differences in C_{max} and AUC between colloidal-Q_{10} and the 3 other formulations were statistically significant. In summary, the data presented suggests that colloidal-Q_{10} improves the enteral absorption and the bioavailability of CoQ_{10} in humans. (*Altern Ther Health Med*. 2009;15(2):#-#.)

Zheng-Xian Liu, PhD, is chief executive officer of GeroNutra, Hayward, California, and Carl Artmann, PhD, is chief executive officer of Phacos GmbH, Gauting, Germany.

Disclosure

The work was funded by Vesifact AG, Baar, Switzerland, and performed at Phacos GmbH, Schrimpfstr. 49/3, D-82131 Gauting, Germany. Zheng-Xian Liu, PhD, is chief executive officer of GeroNutra and served as a paid consultant to SourceOne Global Partners in the preparation of this manuscript but holds no other financial interest in the products or technologies studied or in either Vesifact or SourceOne. Carl Artmann, PhD, is chief executive officer of Phacos GmbH and served as paid consultants to Vesifact in monitoring and analyzing this study but holds no other financial interest in the products or technologies studied or in either Vesifact or SourceOne.

Coenzyme Q_{10} (CoQ_{10}) plays a key role in mitochondrial cell physiology and is a powerful systemic antioxidant. Its chemical structure is shown in Figure 1. In certain conditions, the body's capacity for adequate CoQ_{10} homeostasis is impaired. In such situations, supplementation with CoQ_{10} has been shown to be beneficial.

Due to its poor solubility in water and its relatively high molecular weight (M_r=863) the oral bioavailability of CoQ_{10}, when administered as a powder, is low.[1,2] In the past several years, extensive efforts have been made to improve the oral bioavailability of CoQ_{10}. Examples of formulation strategies aimed at improving the enteral absorption of CoQ_{10} include oil-based formulations, solubilized formulations, and molecular complexes.[3-10] Several of these strategies have been shown to improve the bioavailability of CoQ_{10} as evidenced by their enhanced plasma CoQ_{10} response.

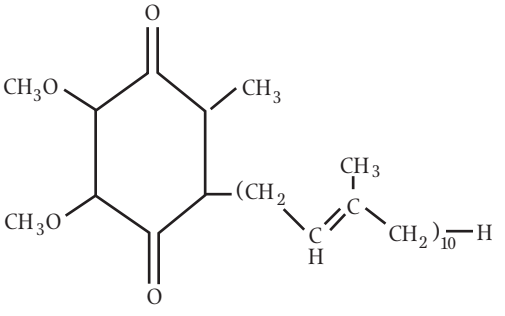


FIGURE 1 Chemical Structure of Coenzyme Q10

It is known that poorly water-soluble supplements (eg, fat-soluble vitamins) are better absorbed when administered after a meal containing fat. One of the reasons for the improved absorption is the enhanced drug solubilization by bile salt-mixed micelles formed from the digestion products of dietary triglycerides (monoglyceride and fatty acids) and bile, a tool developed by nature. The task of naturally formed bile salt-mixed micelles, having a size <10 nm, is to transport the lipophilic molecules through the aqueous environment of the gastrointestinal (GI) tract and across the unstirred water layer to the absorptive epithelium. VESIsorb, a new delivery technology, mimics this natural absorption process to improve bioavailability of poorly water-soluble drugs. The data presented suggest that colloidal-Q_{10}, a CoQ_{10} formulation based on this delivery system, improves the enteral absorption and the bioavailability of CoQ_{10} in humans.

MATERIALS AND METHODS

Design

A double-blind, comparative, controlled (parallel design), single-dose pharmacokinetic study with random assignment of subjects of both sexes was planned. The protocol was approved by the Grosshadern Hospital of Munich ethics commission, and informed consent was obtained from all subjects.

Subjects

Four groups (n=5, n=5, n=5, n=5) of clinically healthy men and women between the ages 18 and 60 years were recruited. Subjects were selected in accordance with the inclusion and exclusion criteria from among the group at Grosshadern Hospital and its facilities. The subjects were informed at the beginning about the nature of the study, its aims, and its execution. The data were acquired and stored in anonymous form.

Inclusion Criteria

- Men and women aged 18 to 60 years
- Clinically healthy, normal body mass index (18.5-25)
- No abnormalities in internal medical history
- No abnormalities in laboratory status
- Subject's agreement to participation in the study

Exclusion Criteria

- Men and women aged under 18 or over 60 years
- Previous history of hematological diseases (eg, known susceptibility to thrombosis)
- Pathological laboratory status (blood count, thrombocytes)
- Medication with vasoactive substances
- Medication affecting coagulation (eg, acetyl salicylic acid, aspirin)
- Medication affecting cholesterol (eg, statins)
- Diabetes
- Skin diseases (acute, chronic, allergic)
- Malignant tumors
- Disorders of heart, kidney, lung, or liver function
- Feverous or infectious diseases
- Alcohol or drug abuse
- Pregnancy or lactation
- Participation in power sports activities or sport activities during the study
- Failure to submit a statement of consent
- Participation in another clinical study within 4 weeks preceding this study or during this study
- Probable noncompliance of the subject; insufficient reliability

Study Preparations

- Product A (colloidal-Q_{10}): 30 mg CoQ_{10} per capsule
- Product B (solubilizate 1): 60 mg CoQ_{10} per capsule
- Product C (oil-based formulation): 30 mg CoQ_{10} per capsule
- Product D (solubilizate 2): 30 mg CoQ_{10} per capsule

Product A was provided by Vesifact AG, Baar, Switzerland. Products B, C, and D are commercially available CoQ_{10} products.

Intervention

Subjects (12 females, 8 males) qualifying for the study on the basis of the inclusion and exclusion criteria were randomized to consume a single oral dose of 120 mg CoQ_{10} in the form of one of the following study preparations:

- 4 capsules of product A (colloidal-Q_{10})
- 2 capsules of product B (solubilizate 1)
- 4 capsules of product C (oil-based formulation)
- 4 capsules of product D (solubilizate 2)

The study preparations were given in the morning before breakfast, on an empty stomach. The taking of blood samples and mealtimes occurred at predetermined regular time intervals (Table 1). For a controlled diet, the same food was eaten among

TABLE 1 Blood Sampling and Mealtimes

Day	Time	Action	Time Elapsed (after CoQ10 intake)
1	07:30-08:00	Blood sample, zero value, empty stomach Administration of 120 mg CoQ10	
	08:00-08:30	Breakfast	
	08:30-09:00	Blood sample	1 h
	09:30-10:00	Blood sample	2 h
	10:30-11:00	Blood sample	3 h
	11:30-12:00	Blood sample	4 h
	12:00-12:30	Lunch	
	12:30-13:00	Blood sample	5 h
	13:30-14:00	Blood sample	6 h
	15:30-16:00	Blood sample	8 h
	17:30-18:00	Blood sample	10 h
	18:00-18:30	Dinner	
2	08:30-09:00	Blood sample, empty stomach	24 h

groups. No other food was eaten (control of compliance).

Analysis of Plasma Samples

Plasma concentration of CoQ_{10} were determined by high-performance liquid chromatography (HPLC) using a Merck/Hitachi HPLC system equipped with an auto sampler (Spectra Physics, Newport Corp, Mountain View, California), a UV detector and an analytical column (Nucleosil RP 18, 5µm, 150 mm x 4 mm, Merck, Whitehouse Station, New Jersey). CoQ_{10} was eluted with acetonitrile and detected at 275 nm.

Statistical Analysis

Data were analysed using GraphPad Prism 3.0 software (GraphPad Software Inc, San Diego, California). For descriptive purposes, the mean and standard deviations of the mean were calculated. The homogeneity of the CoQ_{10} baseline levels at the beginning of the study was statistically evaluated using analysis of variance (ANOVA) and Tukey's multiple comparison test (post hoc test). To assess pharmacokinetic parameters, the area under the observed concentration-time curve above baseline ($AUC_{0\text{-}10h}$) and the observed maximum plasma concentration above baseline (Delta C_{max}) were calculated individually for each volunteer. The AUC and Delta C_{max} were compared after log transformation using ANOVA with the post-hoc Dunnett's multiple comparison test.

A probability level of $P<.05$ was considered to indicate statistical significance.

RESULTS

The pharmacokinetic characteristics of the 4 CoQ_{10} study preparations after a single oral intake of 120 mg CoQ_{10} are summarized in Table 2 and Figure 2. The data show that the mean plasma CoQ_{10} values at baseline were similar in the 4 groups, ranging from 0.75 to 0.90 µg/mL. There was no statistically significant difference between groups A to D (P=.1402). There was a significant increase in CoQ_{10} plasma levels following supplementation in all 4 groups. The kinetic profiles of all 4 preparations revealed a 1-peak plasma concentration-time course. Maximum plasma level was reached between 3 and 5 hours after oral administration. The highest C_{max} values were seen after colloidal-Q_{10} application. Colloidal-Q_{10} had the highest plasma concentration level after 1 hour, and it continued to increase before reaching C_{max} at about 4 hours. The plasma concentration level of colloidal-Q_{10} remained well above the levels associated with the 3 other products throughout the 24-hour period. The relative bioavailability calculated using the $AUC_{(0\text{-}10h)}$ values was also the highest for colloidal-Q_{10}; the $AUC_{(0\text{-}10h)}$ values were 30.6, 6.1, 4.9 and 10.7 µg/ml*h for product A (colloidal-Q_{10}), product B (solubilizate 1), product C (oil-based formulation) and product D (solubilizate 2), respectively. Differences in Delta C_{max} and $AUC_{(0\text{-}10h)}$ between colloidal-Q_{10} and the 3 other formulations were statistically significant. Looking at the $AUC_{(0\text{-}10h)}$, the relative bioavailability of product A was 622% compared to C, 499% to product B, and 286% to product D.

DISCUSSION

The absorption of most drugs depends on 2 processes: (1) the dissolution of the drug in physiological fluids and (2) the absorption process itself (ie, the process by which a drug in solution enters the cells at the absorption site and finally enters general blood circulation). Many drugs are absorbed by passive diffusion (ie, a spontaneous migration of drug molecules from a region of high concentration to a region of low concentration). Other drugs are absorbed by facilitated or active transport, which involves the expenditure of energy by the body. In either event, the dissolution of the drug is the first step in the absorption process unless the drug is administered as a solution. On the

TABLE 2 Pharmacokinetic Parameters of the Four Study Preparations Determined After a Single Oral Intake of 120 mg CoQ_{10}

		Product A (Colloidal-Q10)	Product B (Solubilizate 1)	Product C (Oil-based formulation)	Product D (Solubilizate 2)
Baseline	[µg/mL]				
	Mean	0 90	0.76	0.82	0.75
	SD	0.12	0.11	0.10	0.09
Delta C_{max}	[µg/mL]				
	Mean	5 99	1.68	1.42	2.98
	SD	0.41	0.33	0.39	0.55
C_{max}	[µg/mL]				
	Mean	6.89	2.44	2.24	3.73
	SD	0.51	0.31	0.30	0.49
T_{max}	[h]				
	Mean	4.20	3.40	5.00	4.20
	SD	0.45	0.55	0.00	0.45
$AUC_{(0\text{-}10h)}$	[µg/mL*h]				
	Mean	30.62	6.14	4.92	10.71
	SD	4.24	0.16	1.96	2.35

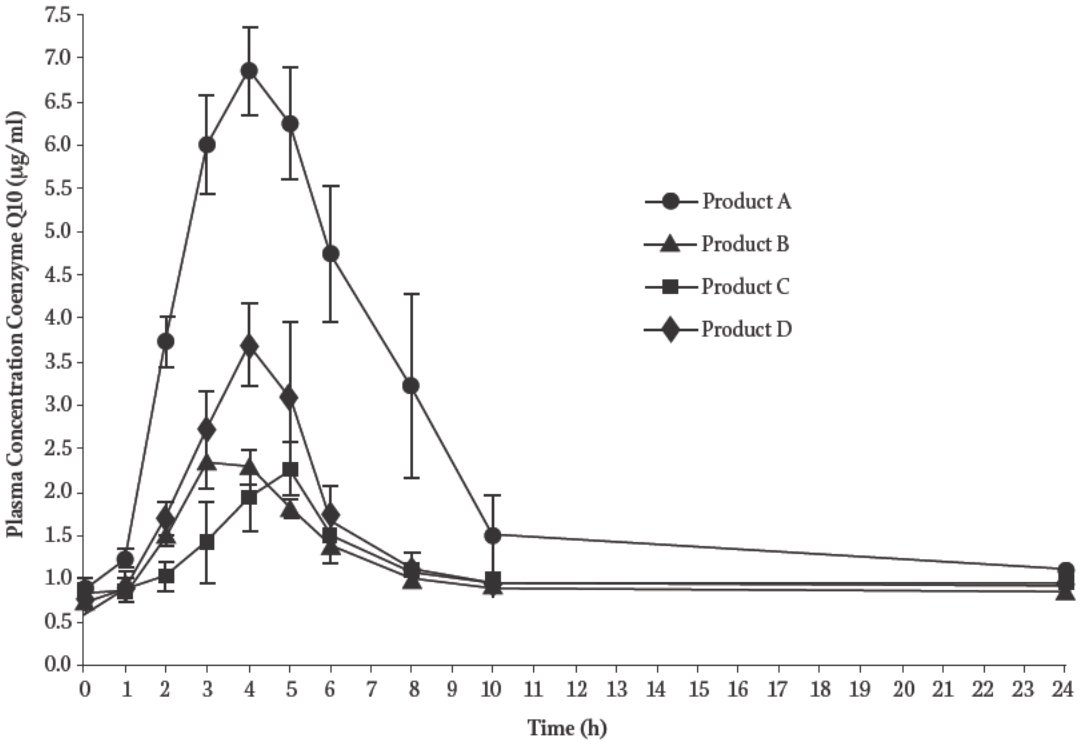


FIGURE 2 Changes in Plasma CoQ10 Concentrations After a Single Oral Intake of 120 mg CoQ10 (n = 20)*

*Product A: colloidal-Q_{10}; product B: solubilizate 1; product C: oil-based formulation; product D: solubilizate 2.

other hand, some drugs are absorbed by the process of pynocytosis or endocytosis, which involves the engulfing of solid particles and the incorporation of such particles into the cellular contents.

To compensate for the poor absorption displayed by many drugs, a formulation may use one or more mechanisms to increase the extent to which the administered drug is absorbed. There are vast numbers of such techniques, which can be grouped into the following broad categories: (1) enhancement of the rate and extent of dissolution and (2) facilitation of an absorption process. Formulating a drug with an oil for the purpose of involving the lymphatic system in the absorption of the drug is an example of the second technique. VESIsorb, the delivery system of colloidal-Q_{10} is an example of the first technique.

VESIsorb was designed to address the poor bioavailability of drugs and natural bioactives like CoQ_{10} exhibiting poor water solubility but high membrane permeability (Biopharmaceutical Classification System: Class II compounds). This delivery system is a lipid-based formulation that self-assembles on contact with an aqueous phase into a colloidal delivery system. The co-administered drug and/or natural bioactive will be solubilized by the in situ formed colloidal system with a mean diameter of <100 nm and a very narrow size distribution as assessed by dynamic laser light scattering using a Zetasizer Nano (Malvern, Worcestershire, United Kingdom). This colloidal solubilization improves the transport of the drug through the aqueous phase of the GI-lumen to the absorptive epithelium, hence its bioavailability. The improvement of oral drug or natural bioactive bioavailability by this technology is broken down into 3 steps: (1) formation of the colloidal delivery system, (2) diffusion across the unstirred water layer, and (3) transfer to the absorption epithelium.

Similar to vitamin E and other lipophilic substances, CoQ_{10} is absorbed, at least partially, by the lymphatic route.[1] Lymphatic absorption involves the following steps: (1) incorporation of CoQ_{10} into lipoproteins/chylomicrons within the enteroyte, (2) secretion of the lipoproteins/chylomicrons from the enterocyte into the lymph vessel, and (3) transport of the lipoproteins/chylomicrons within the lymph vessel to the blood stream. Adequate stimulation of the lipoprotein/chylomicron production is thus of paramount importance for optimal CoQ_{10} absorption by the lymphatic route. This can be achieved by administering CoQ_{10} with or after a meal containing some fat.

CoQ_{10} exhibits non-linear pharmacokinetics (ie, the fraction of a single dose absorbed falls as the dose increases).[11-13] For example, it has been shown that divided dosages (2 x 100 mg) of CoQ_{10} caused a larger increase in plasma levels of CoQ_{10} than a single dose of 200 mg.[12] Larger daily doses of CoQ_{10} should therefore be divided into several doses. Dividing the daily CoQ_{10} dose into several doses will not only maximize the CoQ_{10} absorption, but also reduce the difference between maximal and minimal steady states plasma levels of CoQ_{10}.

In the current study, the posttreatment CoQ_{10} plasma levels of all 4 products are relatively high in comparison to those reported previously. It is difficult to compare the results of this study to other studies: inter-study comparisons are difficult to

make, as variables from food intake to dosing strategy to plasma lipoprotein levels to analytic procedures may affect the results. And there is substantial variation in people's ability to absorb CoQ_{10} in the normal population.[5,14] Additional clinical studies are indicated to verify that the improved absorption with colloidal-Q_{10} correlates with clinical response to treatment.

In the course of the last 25 years of clinical research in treating heart failure of diverse etiology with supplemental CoQ_{10}, it became clear that the initial strategy of normalizing plasma CoQ_{10} status was not effective. Only patients with plasma CoQ_{10} levels >2.5 µg/mL showed significant clinical improvement in heart failure. In fact, therapeutic plasma CoQ_{10} levels are now considered to be > 3.5 µg/ml.[15] Likewise, the pilot trial of CoQ_{10} in patients with Parkinson's disease showed that the benefit was greatest in subjects receiving the highest dosage (1200 mg/d).[16] Thus, a CoQ_{10} formulation exhibiting good CoQ_{10} bioavailability is of great value.

The safety of CoQ_{10}, even at high dosages, is well documented. In particular, a 52-week study revealed no toxicity at a dose of 1200 mg/kg/day,[17] based on which the acceptable daily intake (ADI) for adults weighing 50 kg was estimated to be 600 mg/day. It was also reported in clinical studies of patients with early Parkinson's disease (up to 1200 mg/day for 16 months),[15] Huntington's disease (600mg/day for 30 months),[18] and heart diseases (50-150 mg/day for 3 months)[19] that the frequency of side effects was almost equal to that in the control groups, indicating that the dosage levels examined were within the limits of tolerable intake. In a recent study, the safety profile of CoQ_{10} at high doses for healthy subjects was assessed. CoQ_{10} in capsule form was taken for 4 weeks at doses of 300, 600, and 900 mg/day by a total of 88 adult volunteers. The findings of the study showed that CoQ_{10} was well-tolerated and safe for healthy adults at an intake of up to 900 mg/day.[20] Furthermore, each component of colloidal-CoQ_{10} is Generally Regarded as Safe (GRAS) per the FDA's Code of Federal Regulations (CFR 21) and European regulatory standards, which guarantees the wholesomeness and safety of each ingredient for human consumption. Essentially, it is the FDA's assurance that all ingredients used in food products have undergone toxicological and safety testing to guarantee their safe use in foods.

In summary, this study compared the relative bioavailability of colloidal-Q_{10} with that of 3 commercially available products, 2 CoQ_{10} solubilizates and an oil-based CoQ_{10} formulation after a single oral administration of 120 mg. Our data suggest that the enteral absorption and bioavailability of CoQ_{10} can be enhanced by colloidal-Q_{10} that mimics the naturally occurring mixed micellar transport system of the human body. This also increases the likelihood that this technology can be considered as safe for improving the absorption of drugs with low water solubility. Current research is investigating whether this technology also can be used to improve the absorption of other natural lipophilic actives, such as omega-3, vitamin D, resveratrol, tocotrienols, flavonoids, and gamma-tocopherols.

REFERENCES

1. Bhagavan HN, Chopra RK. Coenzyme Q10: absorption, tissue uptake, metabolism and pharmacokinetic. *Free Radical Research.* 2006;40(5):445-453.
2. Bhagavan HN, Chopra RK. Plasma coenzyme Q10 response to oral ingestion of coenzyme Q10 formulations. *Mitochondrion.* 2007 Jun;7 Suppl:S78-S88.
3. Chopra RK, Goldman R, Sinatra ST, Bhagavan HN. Relative bioavailability of coenzyme Q10 formulations in human subjects. *Int J Vitam Nutr Res.* 1998;68(2):109-113.
4. Miles MV, Horn P, Miles L, Tang P, Steele P, DeGrauw T. Bioequivalence of coenzyme Q10 from over-the-counter supplements. *Nutr Res.* 2002;22(8):919-929.
5. Molyneux S, Florkowski C, Lever M, George P. The bioavailability of coenzyme Q10 supplements available in New Zealand differs markedly. *N Z Med J.* 2004;117(1203):U1108.
6. Ullmann U, Metzner J, Schulz C, Perkins J, Leuenberger B. A new coenzyme Q10 tablet-grade formulation (all-Q) is bioequivalent to Q-Gel and both have better bioavailability properties than Q-SorB. *J Med Food.* 2005;8(3):397-399.
7. Schulz C, Obermüller-Jevic UC, Hasselwander O, Bernhardt J, Biesalski HK. Comparison of the relative bioavailability of different coenzyme Q10 formulations with a novel solubilizate (Solu Q10). *Int J Food Sci Nutr.* 2006;57(7/8):546-555.
8. Nukui K, Yamagishi T, Miyawaki H, Kettawan A, Okamoto T, Sato K. Comparison of uptake between PureSorb-Q40 and regular hydrophobic coenzyme Q10 in rats and humans after single oral intake. *J Nutr Sci Vitaminol (Tokyo).* 2007;53(2):187-190.
9. Wajda R, Zirkel J, Schaffer T. Increase of bioavailability of coenzyme Q(10) and vitamin E. *J Med Food.* 2007;10(4):731-734.
10. Zmitek J, Smidovnik A, Fir M, et al. Relative bioavailability of two forms of a novel water-soluble coenzyme Q10. *Ann Nutr Metab.* 2008;52(4):281-287.
11. Zita C, Overvad K, Mortensen SA, Sindberg CD, Moesgaard S, Hunter DA. Serum coenzyme Q10 concentrations in healthy men supplemented with 30 mg or 100 mg coenzyme Q10 for two months in a randomized controlled study. *BioFactors.* 2003;18(1-4):185-193.
12. Singh RB, Niaz MA, Kumar A, Sindberg CD, Moesgaard S, Littarru GP. Effect on absorption and oxidative stress of different oral Coenzyme Q10 dosages and intake strategy in healthy men. *BioFactors.* 2005;25(1-4):219-224.
13. Shults CW, Beal MF, Song D, Fontaine D. Pilot trial of high dosages of coenzyme Q10 in patients with Parkinson's disease. *Exp Neurol.* 2004;188(2):491-494.
14. Kaikkonen J, Nyyssönen K, Porkkala-Sarataho E, et al. Effect of oral coenzyme Q10 supplementation on the oxidation resistance of human VLDL+LDL fraction: absorption and antioxidative properties of oil and granule-based preparations. *Free Radic Biol Med.* 1997;22(7):1195-1202.
15. Shults CW, Oakes D, Kieburtz K, et al. Effects of coenzyme Q10 in early Parkinson disease: evidence of slowing of the functional decline. *Arch Neurol.* 2002;59(10):1541-1550.
16. Langsjoen PH, Langsjoen AM. Supplemental ubiquinol in patients with advanced congestive heart failure. *Biofactors.* 2008;32(1-4):119-128.
17. Williams KD, Maneke JD, AbdelHameed M, et al. 52-week oral gavage chronic toxicity study with ubiquinone in rats with a 4-week recovery. *J Agric Food Chem.* 1999;47(9):3756-3763.
18. Huntington Study Group. A randomized, placebo-controlled trial of coenzyme Q10 and remacemide in Huntington's disease. *Neurology.* 2001;57(3):397-404.
19. Baggio E, Gandini R, Plancher AC, Passeri M, Carmosino G. Italian multicenter study on the safety and efficacy of coenzyme Q10 as adjunctive therapy in heart failure. *Mol Aspects Med.* 1994;15 Suppl:s287-s294.
20. Ikematsu H, Nakamura K, Harashima S, Fujii K, Fukutomi N. Safety assessment of coenzyme Q10 (Kaneka Q10) in healthy subjects: a double-blind, randomized, placebo-controlled trial. *Regul Toxicol Pharmacol.* 2006;44(3):212-218.

Exhibit 7

eurofins | Supplement Analysis Center

Eurofins Scientific Inc.
Supplement Analysis Center
1365 Redwood Way
Petaluma, CA 94954
Tel.+1 707 792 7300
Fax:+1 707 792 7309

January 21, 2015

Jack Fitzgerald
The Law Office of Jack Fitzgerald, PC
Hillcrest Professional Building
3636 Fourth Avenue, Suite 202
San Diego, CA 92103

CERTIFICATE OF ANALYSIS

AR-15-KK-001262-01

Batch #: EUCAPE-00064386

Sample Identification:

Sample #: 740-2014-00022320
Description: Coenzyme Q-10 100mg Softgel Supplement #1, Lot #J13NM22, Exp. 09/15
Condition: Softgels in a white plastic bottle wrapped in blue tape received at room temperature.
Date Received: December 24, 2014

KK106: Dissolution of Nutritional Supplements by USP/NF
Method Reference: USP
Completed: 01/17/2015

	Result	Theoretical Level
Dissolution	Done	

KK130: Average content weight
Method Reference: Not applicable
Completed: 01/21/2015

	Result	Theoretical Level
Average content weight	523.97 mg/softgel	

KK167: Client Supplied Method (HPLC)
Method Reference: Internal Method
Completed: 01/21/2015

	Result	Theoretical Level
Ubidecarenone (Dissolution)(Water)	<1 mg/softgel	
Ubidecarenone (Strength Test)	99.2 mg/softgel	
Ubidecarenone (Disintegration)(Water)	>60 minute	
Ubidecarenone (Dissolution)(Pepsin)	3.19 mg/softgel	
Ubidecarenone (Disintegration)(Pepsin)	>60 minute	

Results pertain only to the items tested.
All results are reported on an as-is basis unless otherwise stated.
Estimation of uncertainty of measurement is available upon request.

Dani Ignacio
QC Supervisor Analytical Lab

eurofins | Supplement Analysis Center

Eurofins Scientific Inc.
Supplement Analysis Center
1365 Redwood Way
Petaluma, CA 94954
Tel.+1 707 792 7300
Fax:+1 707 792 7309

January 21, 2015

Jack Fitzgerald
The Law Office of Jack Fitzgerald, PC
Hillcrest Professional Building
3636 Fourth Avenue, Suite 202
San Diego, CA 92103

CERTIFICATE OF ANALYSIS

AR-15-KK-001263-01

Batch #: EUCAPE-00064386

Sample Identification:

Sample #: 740-2014-00022321
Description: Coenzyme Q-10 100mg Softgel Supplement #2, Lot #C14NM50, Exp. 02/2016
Condition: Softgels in a white plastic bottle wrapped in blue tape received at room temperature.
Date Received: December 24, 2014

KK106: Dissolution of Nutritional Supplements by USP/NF
Method Reference: USP
Completed: 01/21/2015

	Result	Theoretical Level
Dissolution	Done	

KK130: Average content weight
Method Reference: Not applicable
Completed: 01/21/2015

	Result	Theoretical Level
Average content weight	536.11 mg/softgel	

KK167: Client Supplied Method (HPLC)
Method Reference: Internal Method
Completed: 01/21/2015

	Result	Theoretical Level
Ubidecarenone (Dissolution)(Water)	3.84 mg/softgel	
Ubidecarenone (Strength Test)	99.9 mg/softgel	
Ubidecarenone (Disintegration)(Water)	>60 minute	
Ubidecarenone (Dissolution)(Pepsin)	74.1 mg/softgel	
Ubidecarenone (Disintegration)(Pepsin)	51.0 minute	

Results pertain only to the items tested.
All results are reported on an as-is basis unless otherwise stated.
Estimation of uncertainty of measurement is available upon request.
Results shall not be reproduced except in full without written permission from Eurofins Scientific, Inc.

Dani Ignacio
QC Supervisor Analytical Lab

Exhibit 8

eurofins | Supplement Analysis Center

Eurofins Scientific Inc.
Supplement Analysis Center
1365 Redwood Way
Petaluma, CA 94954
Tel.+1 707 792 7300
Fax:+1 707 792 7309

December 10, 2014

Jack Fitzgerald
The Law Office of Jack Fitzgerald, PC
2870 4th Avenue
Suite 205
San Diego, CA 92103

CERTIFICATE OF ANALYSIS
AR-14-KK-020503-01
Batch #: EUCAPE-00062884

Sample Identification:

Sample #: 740-2014-00020173
Description: Coenzyme Q-10 100mg Softgel Supplement #1, Lot #E14NM12, Exp. 02/16
Condition: Softgels in a white plastic bottle with blue tape received at room temperature.
Date Received: November 24, 2014

KK106: Dissolution of Nutritional Supplements by USP/NF
Method Reference: USP
Completed: 12/10/2014

	Result	Theoretical Level
Dissolution	Done	

KK130: Average content weight
Method Reference: Not applicable
Completed: 12/10/2014

	Result	Theoretical Level
Average content weight	529.23 mg/softgel	

KK167: Client Supplied Method (HPLC)
Method Reference: Internal Method
Completed: 12/10/2014

	Result	Theoretical Level
Ubidecarenone (Dissolution) (Water)	2.21 mg/softgel	Unknown mg/softgel
Ubidecarenone (Dissolution) (Pepsin)	75.4 mg/softgel	Unknown mg/softgel
Ubidecarenone (Strength Test)	100 mg/softgel	Unknown mg/softgel

KK169: Client Supplied Method (WT/UV)
Method Reference: Not applicable
Completed: 12/10/2014

	Result	Theoretical Level
Ubidecarenone (Disintegration) (Water)	>60 minute	Unknown mg/softgel
Ubidecarenone (Disintegration) (Pepsin)	49.0 minute	Unknown mg/softgel

eurofins

Sample #: 740-2014-00020173

The Law Office of Jack Fitzgerald, PC
2870 4th Avenue
Suite 205
San Diego, CA 92103

Results pertain only to the items tested.
All results are reported on an as-is basis unless otherwise stated.
Estimation of uncertainty of measurement is available upon request.

Dani Ignacio
QC Supervisor Analytical Lab

eurofins | Supplement Analysis Center

Eurofins Scientific Inc.
Supplement Analysis Center
1365 Redwood Way
Petaluma, CA 94954
Tel.+1 707 792 7300
Fax:+1 707 792 7309

December 10, 2014

Jack Fitzgerald
The Law Office of Jack Fitzgerald, PC
2870 4th Avenue
Suite 205
San Diego, CA 92103

CERTIFICATE OF ANALYSIS
AR-14-KK-020504-01
Batch #: EUCAPE-00062884

Sample Identification:

Sample #: 740-2014-00020174
Description: Coenzyme Q-10 200mg Softgel Supplement #2, Lot #E14NM20, Exp. 03/16
Condition: Softgels in a white plastic bottle with blue tape received at room temperature.
Date Received: November 24, 2014

KK106: Dissolution of Nutritional Supplements by USP/NF
Method Reference: USP
Completed: 12/10/2014

	Result	Theoretical Level
Dissolution	Done	

KK130: Average content weight
Method Reference: Not applicable
Completed: 12/10/2014

	Result	Theoretical Level
Average content weight	1,104.3 mg/softgel	

KK167: Client Supplied Method (HPLC)
Method Reference: Internal Method
Completed: 12/10/2014

	Result	Theoretical Level
Ubidecarenone (Strength Test)	212 mg/softgel	Unknown mg/softgel
Ubidecarenone (Dissolution) (Water)	61.2 mg/softgel	Unknown mg/softgel
Ubidecarenone (Dissolution) (Pepsin)	186 mg/softgel	Unknown mg/softgel

KK169: Client Supplied Method (WT/UV)
Method Reference: Not applicable
Completed: 12/10/2014

	Result	Theoretical Level
Ubidecarenone (Disintegration) (Water)	58.0 minute	Unknown mg/softgel
Ubidecarenone (Disintegration) (Pepsin)	35.0 minute	Unknown mg/softgel

eurofins

Sample #: 740-2014-00020174

The Law Office of Jack Fitzgerald, PC
2870 4th Avenue
Suite 205
San Diego, CA 92103

Results pertain only to the items tested.
All results are reported on an as-is basis unless otherwise stated.
Estimation of uncertainty of measurement is available upon request.

Dani Ignacio
QC Supervisor Analytical Lab

Exhibit 9

eurofins | Supplement Analysis Center

Eurofins Scientific Inc.
Supplement Analysis Center
1365 Redwood Way
Petaluma, CA 94954
Tel.+1 707 792 7300
Fax:+1 707 792 7309

July 21, 2014

Jack Fitzgerald
The Law Office of Jack Fitzgerald, PC
2870 4th Avenue
Suite 205
San Diego, CA 92103

CERTIFICATE OF ANALYSIS

AR-14-KK-011885-01

Batch #: EUCAPE-00056352

Sample Identification:

Sample #: 740-2014-00011317
Description: Coenzyme Q-10 100mg Softgel Supplement #1, Lot #G13NM13, Exp. 03/15
Condition: Softgels in a white plastic bottle received at room temperature.
Date Received: July 07, 2014

KK106: Dissolution of Nutritional Supplements by USP/NF
Method Reference: USP

Completed: 07/21/2014	**Result**	**Theoretical Level**
Dissolution	Done	

KK130: Average content weight
Method Reference: Not applicable

Completed: 07/21/2014	**Result**	**Theoretical Level**
Average content weight	540.70 mg/softgel	

KK167: Client Supplied Method (HPLC)
Method Reference: Internal Method

Completed: 07/21/2014	**Result**	**Theoretical Level**
Ubidecarenone (Strength Test)	96.3 mg/softgel	
Ubidecarenone (Dissolution)(Water)	<2 mg/softgel	
Ubidecarenone (Dissolution)(Pepsin)(retest)	45.3 mg/softgel	

KK169: Client Supplied Method (WT/UV)
Method Reference: Not applicable

Completed: 07/21/2014	**Result**	**Theoretical Level**
Ubidecarenone (Disintegration)(Water)	>60 minute	
Ubidecarenone (Disintegration)(Pepsin)(retest)	47 minute	

eurofins

Sample #: 740-2014-00011317

The Law Office of Jack Fitzgerald, PC
2870 4th Avenue
Suite 205
San Diego, CA 92103

Results pertain only to the items tested.
Estimation of uncertainty of measurement is available upon request.

Mariel Esguerra
Technical Accounts Manager

eurofins | Supplement Analysis Center

Eurofins Scientific Inc.
Supplement Analysis Center
1365 Redwood Way
Petaluma, CA 94954
Tel.+1 707 792 7300
Fax:+1 707 792 7309

July 21, 2014

Jack Fitzgerald
The Law Office of Jack Fitzgerald, PC
2870 4th Avenue
Suite 205
San Diego, CA 92103

CERTIFICATE OF ANALYSIS

AR-14-KK-011891-01

Batch #: EUCAPE-00056352

Sample Identification:

Sample #: 740-2014-00011318
Description: Coenzyme Q-10 100mg Softgel Supplement #2, Lot #1341-2121, Exp. 03/2016
Condition: Softgels in a white plastic bottle received at room temperature.
Date Received: July 07, 2014

KK106: Dissolution of Nutritional Supplements by USP/NF
Method Reference: USP
Completed: 07/21/2014

	Result	Theoretical Level
Dissolution	Done	

KK130: Average content weight
Method Reference: Not applicable
Completed: 07/21/2014

	Result	Theoretical Level
Average content weight	943.85 mg/softgel	

KK167: Client Supplied Method (HPLC)
Method Reference: Internal Method
Completed: 07/21/2014

	Result	Theoretical Level
Ubidecarenone (Strength Test)	95.4 mg/softgel	
Ubidecarenone (Dissolution)(water)	92.7 mg/softgel	

KK169: Client Supplied Method (WT/UV)
Method Reference: Not applicable
Completed: 07/21/2014

	Result	Theoretical Level
Ubidecarenone (Disintegration)(water)	13 minute	

Results pertain only to the items tested.
Estimation of uncertainty of measurement is available upon request.

Mariel Esguerra
Technical Accounts Manager

Exhibit 10

ABC Testing

Advanced Botanical Consulting & Testing, Inc.

1169 Warner Ave., Tustin, CA 92780, Phone: (714) 259-0384 Fax: (714) 259-0385

Lang Pharma Nutrition Inc.
20 Silva Lane
Middletown, RI 02842
Tel.: (401) 848-7700/ (401) 848-6211 (E. Kahn, Direct)
Fax: (401) 848-7701

ATTN: Ellen Kahn
P. O. #:

Client Sample ID: CVS Ultra CoQ-10 (60 softgels)
Lot #: F12NM10 (Stability 18M@ 40C/75%RH)

Lab #: 87002

Received Date: 08/08/2012
Date In: 08/08/2012
Date Out: 02/06/2014
Report Date: 02/18/2014

Analyses	Results
Color (Visual)	Orange/red softgels
Odor (Organoleptic)	Citrus/fruity
Coenzyme Q10 (HPLC)	101.72 mg/softgel
Moisture content (Karl Fischer)	2.16 % (content only)
Rupture (USP)	Fail, >30 min
Average fill weight (based on 10)	533.03 mg/softgel

Method: ASTA method manual, ALC151A, USP36/NF31

Analyzed by: _____ Chemist

Approved by: _____ Wendi Wang, PhD, President

Exhibit 11

TBAR

Tampa Bay Analytical Research, Inc.

13130 56th Court STE 606 Clearwater, FL 33760 USA

Ph: 727-540-0900 Fax: 727-540-0922

Assay Result Form

Number:	ARF-TM05446	Sample Name:	CoQ10		
Control Number:	TM05446	Sample Lot #:	**#1**		
Customer Name:	Law Offices of J.F.	Address:	**San Diego, CA**		
Date:	11/22/2013	Project #:	PR2124	Version:	2

Analyte	Method Reference	Specification	Result	Date Tested	Notebook Reference
CoQ10 Capsule 1	TBAR-TM-012 Dissolution	NA	**None Detected** Notes :a,b	11/18/2013	TBAR-110-95
CoQ10 Capsule 2		NA	**None Detected** Notes: b		
CoQ10 Capsule 3		NA	**27.9 mg** Notes: c		
CoQ10 Capsule 4		NA	**0.578 mg** Notes: b		
CoQ10 Capsule 5		NA	**None Detected** Notes: b		
CoQ10 Capsule 6		NA	**None Detected** Notes : b		

Notes:

a. Ubidecarenone reference standard: Kaneka lot S376, 99.9% purity

b. No visible rupture observed after 60 minutes

c. Approximate rupture time of 50 minutes

Documentation to support these results is on file at Tampa Bay Analytical Research. All quantitative results are rounded to three (3) significant figures. This product analysis is for the benefit of the client only, and results are applicable only to the test material submitted to Tampa Bay Analytical Research, and can not be applied to any other test material or sample. It is the responsibility of the client to determine the suitability of the information provided in this report for their specific use.

File: \\TBAR-2\Documents (E:)\QualityManual\SOPs\Forms\5.8.01-F2

Written By: Robert Arce — Robert Arce, Quality Assurance Manager

Digitally signed by Robert Arce
DN: cn=Robert Arce c=US o=Tampa Bay Analytical Research, Inc. ou=Tampa Bay Analytical Research, Inc. e=rarce@tampabayanalytical.com
Reason: I am the author of this document
Location:
Date: 2013-11-22 09:26-05 00

Approved By: Mark Roman, President

Digitally signed by Mark C. Roman
DN: cn=Mark C. Roman gn=Mark C. Roman c=United States l=US o=Tampa Bay Analytical Research, Inc. e=mroman@tampabayanalytical.com
Reason: I am approving this document
Location: Clearwater, FL
Date: 2013-11-22 09:40-05 00

TBAR

Tampa Bay Analytical Research, Inc.

13130 56th Court STE 606 Clearwater, FL 33760 USA

Ph: 727-540-0900 Fax: 727-540-0922

Assay Result Form

Number:	ARF-TM05447	Sample Name:	CoQ10		
Control Number:	TM05447	Sample Lot #:	**#2**		
Customer Name:	Law Offices of J.F.	Address:	**San Diego, CA**		
Date:	11/22/2013	Project #:	PR2124	Version:	2

Analyte	Method Reference	Specification	Result	Date Tested	Notebook Reference
CoQ10 Capsule 1	TBAR-TM-012 Dissolution	NA	**None Detected** Notes :a, b	11/18/2013	TBAR-110-95
CoQ10 Capsule 2		NA	**None Detected** Notes: b		
CoQ10 Capsule 3		NA	**27.6 mg** Notes: c		
CoQ10 Capsule 4		NA	**0.720 mg** Notes: b		
CoQ10 Capsule 5		NA	**0.564 mg** Notes: b		
CoQ10 Capsule 6		NA	**None Detected** Notes: b		

Notes:

a. Ubidecarenone reference standard: Kaneka lot S376, 99.9% purity

b. No visible rupture observed after 60 minutes

c. Approximate rupture time of 50 minutes

Documentation to support these results is on file at Tampa Bay Analytical Research. All quantitative results are rounded to three (3) significant figures. This product analysis is for the benefit of the client only, and results are applicable only to the test material submitted to Tampa Bay Analytical Research, and can not be applied to any other test material or sample. It is the responsibility of the client to determine the suitability of the information provided in this report for their specific use.

File: \\TBAR-2\Documents (E:)\QualityManual\SOPs\Forms\5.8.01-F2

Written By: Robert Arce

Robert Arce
Quality Assurance Manager

Digitally signed by Robert Arce
DN: cn=Robert Arce c=US o=Tampa Bay Analytical Research, Inc ou=Tampa Bay Analytical Research, Inc e=rarce@tampabayanalytical.com
Reason: I am the author of this document
Location:
Date: 2013-11-22 10:04:05:00

Approved By:

Mark Roman
President

Digitally signed by Mark C. Roman
DN: cn=Mark C. Roman gn=Mark C. Roman c=United States l=US o=Tampa Bay Analytical Research, Inc e=mroman@tampabayanalytical.com
Reason: I am approving this document
Location: Clearwater, FL
Date: 2013.11.22 10:39:05:00

Exhibit 12

ABC Testing

Advanced Botanical Consulting & Testing, Inc.

1169 Warner Ave., Tustin, CA 92780, Phone: (714) 259-0384 Fax: (714) 259-0385

Lang Pharma Nutrition Inc.
20 Silva Lane
Middletown, RI 02842
Tel.: (401) 848-7700/ (401) 848-6211 (E. Kahn, Direct)
Fax: (401) 848-7701

ATTN: Ellen Kahn
P. O. #: 20130905

Client Sample ID: CoQ10 w/ VesiSorb (30 softgels)
Item#: C13NM29
Lot #:1211031, Exp. 01/15
Lab #: 104609

Received Date: 09/06/2013

Report Date: 09/10/2013

Analyses	Results	%Dissolved
CoQ10 (HPLC)	93.44 mg/ softgel	
Dissolution (500ml H2O, 75RPM, 37.5C)		
CoQ10 (HPLC)--when directly filtered & injected	36. 23mg/softgel*	39%
CoQ10 (HPLC)-when using IPA in 5:1 ratio to dilute out the aqueous dissolution medium	110.22 mg/softgel	118%
Average fill weight (based on 10)	539.25 mg/ softgel	

Method: ALC151A, USP36/NF31

* CoQ10 in the softgels once ruptured was physically suspended in the dissolution medium, not chemically solublized. If the solution is directly filtered and injected, the unsolublized portion is removed by the filtration step, which lead to low result. The dissolution sample needs to be properly diluted with organic solvent like isopropyl alcohol to assure complete solublization of the CoQ10, prior to injection into the HPLC. The above 2 results are firm confirmation of the concept. Results are based on one pooled dissolution sample from 6 vessels. Result is based on one trial only

Analyzed by: _____ Chemist

Approved by: _____ Wendi Wang, PhD, President

Exhibit 13

COVANCE

Report Number:	**852626-0**
Report Date:	**12-Aug-2013**
Report Status:	**Final**
Supercedes :	**850236-0**

Certificate of Analysis

[redacted]

Sample Name:	[redacted]	**Covance Sample:**	**2304502**
Project ID	[redacted]-20130802-0001	**Receipt Date**	02-Aug-2013
PO Number	Charge/VISA	**Receipt Condition**	Ambient temperature
Lot Number	Lot 1	**Login Date**	02-Aug-2013
Sample Serving Size	1 Softgel	**Storage Condition**	5 (+/- 3) degrees Celsius
		Number Composited	20
		Online Order	20

Analysis	Result
Calculated Sample Weight	
Entity Weight	0.7441 g
Coenzyme Q10 Dissolution	
Coenzyme Q10	48.2 mg/g
Coenzyme Q10	56.3 mg/g
Coenzyme Q10	54.5 mg/g
Coenzyme Q10	59.2 mg/g
Coenzyme Q10	57.5 mg/g
Coenzyme Q10	56.2 mg/g
Coenzyme Q10	35.9 mg/Serving Size
% of Claim (100 mg/softgel)	35.9 %
Coenzyme Q10	41.9 mg/Serving Size
% of Claim (100 mg/softgel)	41.9 %
Coenzyme Q10	40.6 mg/Serving Size
% of Claim (100 mg/softgel)	40.6 %
Coenzyme Q10	44.1 mg/Serving Size
% of Claim (100 mg/softgel)	44.1 %
Coenzyme Q10	42.8 mg/Serving Size
% of Claim (100 mg/softgel)	42.8 %
Coenzyme Q10	41.8 mg/Serving Size
% of Claim (100 mg/softgel)	41.8 %
Dissolution	
Disintegrated in Specified Time Frame	yes

Method References	Testing Location
Calculated Sample Weight (PREP:8)	**Covance Laboratories - Madison**
Coenzyme Q10 Dissolution (Q10_S:4)	**Covance Laboratories - Madison**

Official Methods of Analysis of AOAC INTERNATIONAL, (2005) 18th ED., AOAC INTERNATIONAL Gaithersburg, MD, USA, Official Method 2008.07.

COVANCE

Report Number:	**852626-0**
Report Date:	**12-Aug-2013**
Report Status:	**Final**
Supercedes :	**850236-0**

Certificate of Analysis

[redacted]

Method References	Testing Location
Dissolution (DISL:4)	**Covance Laboratories - Madison**

United States Pharmacopeia, Thirty Fourth Revision, <2040>, <711>, United States Pharmacopeial Convention, Inc.: Rockville, Maryland (2011).

Client Supplied Method

Testing Location(s)	Released on Behalf of Covance by
Covance Laboratories - Madison	**Lori Ross - Associate Director**

3301 Kinsman Blvd
Madison WI 53704
608-242-2712 x4170

COVANCE

Report Number:	**852627-0**
Report Date:	**12-Aug-2013**
Report Status:	**Final**
Supercedes :	**850237-0**

Certificate of Analysis

[redacted]

Sample Name:	[redacted]	**Covance Sample:**	**2304503**
Project ID	[redacted]-20130802-0001	**Receipt Date**	02-Aug-2013
PO Number	Charge/VISA	**Receipt Condition**	Ambient temperature
Lot Number	Lot 2	**Login Date**	02-Aug-2013
Sample Serving Size	1 Softgel	**Storage Condition**	5 (+/- 3) degrees Celsius
		Number Composited	20
		Online Order	20

Analysis	Result
Calculated Sample Weight	
Entity Weight	0.7435 g
Coenzyme Q10 Dissolution	
Coenzyme Q10	65.5 mg/g
Coenzyme Q10	55.7 mg/g
Coenzyme Q10	56.2 mg/g
Coenzyme Q10	53.9 mg/g
Coenzyme Q10	49.5 mg/g
Coenzyme Q10	52.4 mg/g
Coenzyme Q10	48.7 mg/Serving Size
% of Claim (100 mg/softgel)	48.7 %
Coenzyme Q10	41.4 mg/Serving Size
% of Claim (100 mg/softgel)	41.4 %
Coenzyme Q10	41.8 mg/Serving Size
% of Claim (100 mg/softgel)	41.8 %
Coenzyme Q10	40.1 mg/Serving Size
% of Claim (100 mg/softgel)	40.1 %
Coenzyme Q10	36.8 mg/Serving Size
% of Claim (100 mg/softgel)	36.8 %
Coenzyme Q10	39.0 mg/Serving Size
% of Claim (100 mg/softgel)	39.0 %
Dissolution	
Disintegrated in Specified Time Frame	Yes

Method References	Testing Location
Calculated Sample Weight (PREP:8)	**Covance Laboratories - Madison**
Coenzyme Q10 Dissolution (Q10_S:4)	**Covance Laboratories - Madison**

Official Methods of Analysis of AOAC INTERNATIONAL, (2005) 18th ED., AOAC INTERNATIONAL Gaithersburg, MD, USA, Official Method 2008.07.

COVANCE

Report Number:	**852627-0**
Report Date:	**12-Aug-2013**
Report Status:	**Final**
Supercedes :	**850237-0**

Certificate of Analysis

[redacted]

Method References	Testing Location
Dissolution (DISL:4)	**Covance Laboratories - Madison**

United States Pharmacopeia, Thirty Fourth Revision, <2040>, <711>, United States Pharmacopeial Convention, Inc.: Rockville, Maryland (2011).

Client Supplied Method

Testing Location(s)	Released on Behalf of Covance by
Covance Laboratories - Madison	**Lori Ross - Associate Director**

3301 Kinsman Blvd
Madison WI 53704
608-242-2712 x4170

Exhibit 14

THE LAW OFFICE OF JACK FITZGERALD, PC
JACK FITZGERALD (257370)
jack@jackfitzgeraldlaw.com
TREVOR M. FLYNN (253362)
trevor@jackfitzgeraldlaw.com
TRAN NGUYEN (310593)
tran@jackfitzgeraldlaw.com
Hillcrest Professional Building
3636 4th Ave., Ste. 202
San Diego, CA 92103
Phone: (619) 692-3840
Fax: (619) 362-9555

LAW OFFICES OF RONALD A. MARRON, APLC
RONALD A. MARRON (175650)
ron@consumersadvocates.com
SKYE RESENDES (278511)
skye@consumersadvocates.com
ALEXIS M. WOOD (270200)
alexis@consumersadvocates.com
651 Arroyo Drive
San Diego, CA 92103
Phone: (619) 696-9006
Fax: (619) 564-6665

Counsel for Plaintiffs and the Putative Class

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA

GARY REYNOLDS and ROBERT MASON, on behalf of themselves, all others similarly situated, and the general public,

Plaintiffs,

v.

WALGREEN CO.,

CONSUMERS LEGAL REMEDIES ACT VENUE AFFIDAVIT [CCP § 1780(d)]

I, Gary Reynolds, declare as follows:

1. I am a plaintiff in this action. I make this affidavit as required by California Civil Code § 1780(d).

2. The Complaint in this action is filed in a proper place for the trial of this action because defendant is doing business in this county.

3. The Complaint in this action is further filed in a proper place for the trial of this action because the transactions that are the subject of the action occurred in this county.

I declare under penalty of perjury under the laws of the United States that the foregoing is true and correct.

Executed this 22 day of January, 2015, at Oakland, California.

Gary Reynolds

THE LAW OFFICE OF JACK FITZGERALD, PC
JACK FITZGERALD (257370)
jack@jackfitzgeraldlaw.com
TREVOR M. FLYNN (253362)
trevor@jackfitzgeraldlaw.com
TRAN NGUYEN (310593)
tran@jackfitzgeraldlaw.com
Hillcrest Professional Building
3636 4th Ave., Ste. 202
San Diego, CA 92103
Phone: (619) 692-3840
Fax: (619) 362-9555

LAW OFFICES OF RONALD A. MARRON, APLC
RONALD A. MARRON (175650)
ron@consumersadvocates.com
SKYE RESENDES (278511)
skye@consumersadvocates.com
ALEXIS M. WOOD (270200)
alexis@consumersadvocates.com
651 Arroyo Drive
San Diego, CA 92103
Phone: (619) 696-9006
Fax: (619) 564-6665

Counsel for Plaintiffs and the Putative Class

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA

GARY REYNOLDS and ROBERT MASON, on behalf of themselves, all others similarly situated, and the general public,

Plaintiffs,

v.

WALGREEN CO.,

Defendant.

CONSUMERS LEGAL REMEDIES ACT VENUE AFFIDAVIT [CCP § 1780(d)]

I, Robert Mason, declare as follows:

1. I am a plaintiff in this action. I make this affidavit as required by California Civil Code § 1780(d).

2. The Complaint in this action is filed in a proper place for the trial of this action because defendant is doing business in this county.

3. The Complaint in this action is further filed in a proper place for the trial of this action because the transactions that are the subject of the action occurred in this county.

I declare under penalty of perjury under the laws of the United States that the foregoing is true and correct.

Executed this 22nd day of January, 2015, at San Jacunto, California.

Robert Mason

Robert Mason

JS 44 (Rev. 12/12) cand rev (1/15/13)

CIVIL COVER SHEET

The JS 44 civil cover sheet and the information contained herein neither replace nor supplement the filing and service of pleadings or other papers as required by law, except as provided by local rules of court. This form, approved by the Judicial Conference of the United States in September 1974, is required for the use of the Clerk of Court for the purpose of initiating the civil docket sheet. *(SEE INSTRUCTIONS ON NEXT PAGE OF THIS FORM.)*

I. (a) PLAINTIFFS

GARY REYNOLDS and ROBERT MASON, on behalf of themselves and all others similarly situated

(b) County of Residence of First Listed Plaintiff Alameda
(EXCEPT IN U.S. PLAINTIFF CASES)

(c) Attorneys *(Firm Name, Address, and Telephone Number)*
Jack Fitzgerald, The Law Office of Jack Fitzgerald, PC, 3636 4th Ave., Ste. 202, San Diego, CA 92103, (619) 692-3840

DEFENDANTS

WALGREEN CO.

County of Residence of First Listed Defendant
(IN U.S. PLAINTIFF CASES ONLY)
NOTE: IN LAND CONDEMNATION CASES, USE THE LOCATION OF THE TRACT OF LAND INVOLVED.

Attorneys *(If Known)*

II. BASIS OF JURISDICTION *(Place an "X" in One Box Only)*

- ❒ 1 U.S. Government Plaintiff
- ☒ 3 Federal Question *(U.S. Government Not a Party)*
- ❒ 2 U.S. Government Defendant
- ❒ 4 Diversity *(Indicate Citizenship of Parties in Item III)*

III. CITIZENSHIP OF PRINCIPAL PARTIES *(Place an "X" in One Box for Plaintiff and One Box for Defendant)*

(For Diversity Cases Only)

	PTF	DEF		PTF	DEF
Citizen of This State	❒ 1	❒ 1	Incorporated *or* Principal Place of Business In This State	❒ 4	❒ 4
Citizen of Another State	❒ 2	❒ 2	Incorporated *and* Principal Place of Business In Another State	❒ 5	❒ 5
Citizen or Subject of a Foreign Country	❒ 3	❒ 3	Foreign Nation	❒ 6	❒ 6

IV. NATURE OF SUIT *(Place an "X" in One Box Only)*

CONTRACT
- ❒ 110 Insurance
- ❒ 120 Marine
- ❒ 130 Miller Act
- ❒ 140 Negotiable Instrument
- ❒ 150 Recovery of Overpayment & Enforcement of Judgment
- ❒ 151 Medicare Act
- ❒ 152 Recovery of Defaulted Student Loans (Excludes Veterans)
- ❒ 153 Recovery of Overpayment of Veteran's Benefits
- ❒ 160 Stockholders' Suits
- ❒ 190 Other Contract
- ❒ 195 Contract Product Liability
- ❒ 196 Franchise

REAL PROPERTY
- ❒ 210 Land Condemnation
- ❒ 220 Foreclosure
- ❒ 230 Rent Lease & Ejectment
- ❒ 240 Torts to Land
- ☒ 245 Tort Product Liability
- ❒ 290 All Other Real Property

TORTS

PERSONAL INJURY
- ❒ 310 Airplane
- ❒ 315 Airplane Product Liability
- ❒ 320 Assault, Libel & Slander
- ❒ 330 Federal Employers' Liability
- ❒ 340 Marine
- ❒ 345 Marine Product Liability
- ❒ 350 Motor Vehicle
- ❒ 355 Motor Vehicle Product Liability
- ❒ 360 Other Personal Injury
- ❒ 362 Personal Injury - Medical Malpractice

PERSONAL INJURY
- ❒ 365 Personal Injury - Product Liability
- ❒ 367 Health Care/ Pharmaceutical Personal Injury Product Liability
- ❒ 368 Asbestos Personal Injury Product Liability

PERSONAL PROPERTY
- ❒ 370 Other Fraud
- ❒ 371 Truth in Lending
- ❒ 380 Other Personal Property Damage
- ❒ 385 Property Damage Product Liability

CIVIL RIGHTS
- ❒ 440 Other Civil Rights
- ❒ 441 Voting
- ❒ 442 Employment
- ❒ 443 Housing/ Accommodations
- ❒ 445 Amer. w/Disabilities - Employment
- ❒ 446 Amer. w/Disabilities - Other
- ❒ 448 Education

PRISONER PETITIONS

Habeas Corpus:
- ❒ 463 Alien Detainee
- ❒ 510 Motions to Vacate Sentence
- ❒ 530 General
- ❒ 535 Death Penalty

Other:
- ❒ 540 Mandamus & Other
- ❒ 550 Civil Rights
- ❒ 555 Prison Condition
- ❒ 560 Civil Detainee - Conditions of Confinement

FORFEITURE/PENALTY
- ❒ 625 Drug Related Seizure of Property 21 USC 881
- ❒ 690 Other

LABOR
- ❒ 710 Fair Labor Standards Act
- ❒ 720 Labor/Management Relations
- ❒ 740 Railway Labor Act
- ❒ 751 Family and Medical Leave Act
- ❒ 790 Other Labor Litigation
- ❒ 791 Employee Retirement Income Security Act

IMMIGRATION
- ❒ 462 Naturalization Application
- ❒ 465 Other Immigration Actions

BANKRUPTCY
- ❒ 422 Appeal 28 USC 158
- ❒ 423 Withdrawal 28 USC 157

PROPERTY RIGHTS
- ❒ 820 Copyrights
- ❒ 830 Patent
- ❒ 840 Trademark

SOCIAL SECURITY
- ❒ 861 HIA (1395ff)
- ❒ 862 Black Lung (923)
- ❒ 863 DIWC/DIWW (405(g))
- ❒ 864 SSID Title XVI
- ❒ 865 RSI (405(g))

FEDERAL TAX SUITS
- ❒ 870 Taxes (U.S. Plaintiff or Defendant)
- ❒ 871 IRS—Third Party 26 USC 7609

OTHER STATUTES
- ❒ 375 False Claims Act
- ❒ 400 State Reapportionment
- ❒ 410 Antitrust
- ❒ 430 Banks and Banking
- ❒ 450 Commerce
- ❒ 460 Deportation
- ❒ 470 Racketeer Influenced and Corrupt Organizations
- ❒ 480 Consumer Credit
- ❒ 490 Cable/Sat TV
- ❒ 850 Securities/Commodities/ Exchange
- ❒ 890 Other Statutory Actions
- ❒ 891 Agricultural Acts
- ❒ 893 Environmental Matters
- ❒ 895 Freedom of Information Act
- ❒ 896 Arbitration
- ❒ 899 Administrative Procedure Act/Review or Appeal of Agency Decision
- ❒ 950 Constitutionality of State Statutes

V. ORIGIN *(Place an "X" in One Box Only)*

☒ 1 Original Proceeding ❒ 2 Removed from State Court ❒ 3 Remanded from Appellate Court ❒ 4 Reinstated or Reopened ❒ 5 Transferred from Another District *(specify)* ❒ 6 Multidistrict Litigation

VI. CAUSE OF ACTION

Cite the U.S. Civil Statute under which you are filing ***(Do not cite jurisdictional statutes unless diversity)***:
28 U.S.C. s. 1332(d)(2)(A), the Class Action Fairness Act

Brief description of cause:
False Advertising

VII. REQUESTED IN COMPLAINT:

☒ CHECK IF THIS IS A **CLASS ACTION** UNDER RULE 23, F.R.Cv.P.

DEMAND $

CHECK YES only if demanded in complaint:
JURY DEMAND: ☒ Yes ❒ No

VIII. RELATED CASE(S) IF ANY

(See instructions): JUDGE _____ DOCKET NUMBER _____

DATE
01/23/2015

SIGNATURE OF ATTORNEY OF RECORD
/s/ Jack Fitzgerald

IX. DIVISIONAL ASSIGNMENT (Civil L.R. 3-2)

(Place an "X" in One Box Only) ☑ SAN FRANCISCO/OAKLAND ☐ SAN JOSE ☐ EUREKA

INSTRUCTIONS FOR ATTORNEYS COMPLETING CIVIL COVER SHEET FORM JS 44

Authority For Civil Cover Sheet

The JS 44 civil cover sheet and the information contained herein neither replaces nor supplements the filings and service of pleading or other papers as required by law, except as provided by local rules of court. This form, approved by the Judicial Conference of the United States in September 1974, is required for the use of the Clerk of Court for the purpose of initiating the civil docket sheet. Consequently, a civil cover sheet is submitted to the Clerk of Court for each civil complaint filed. The attorney filing a case should complete the form as follows:

I.(a) **Plaintiffs-Defendants.** Enter names (last, first, middle initial) of plaintiff and defendant. If the plaintiff or defendant is a government agency, use only the full name or standard abbreviations. If the plaintiff or defendant is an official within a government agency, identify first the agency and then the official, giving both name and title.

(b) **County of Residence.** For each civil case filed, except U.S. plaintiff cases, enter the name of the county where the first listed plaintiff resides at the time of filing. In U.S. plaintiff cases, enter the name of the county in which the first listed defendant resides at the time of filing. (NOTE: In land condemnation cases, the county of residence of the "defendant" is the location of the tract of land involved.)

(c) **Attorneys.** Enter the firm name, address, telephone number, and attorney of record. If there are several attorneys, list them on an attachment, noting in this section "(see attachment)".

II. **Jurisdiction.** The basis of jurisdiction is set forth under Rule 8(a), F.R.Cv.P., which requires that jurisdictions be shown in pleadings. Place an "X" in one of the boxes. If there is more than one basis of jurisdiction, precedence is given in the order shown below.
United States plaintiff. (1) Jurisdiction based on 28 U.S.C. 1345 and 1348. Suits by agencies and officers of the United States are included here.
United States defendant. (2) When the plaintiff is suing the United States, its officers or agencies, place an "X" in this box.
Federal question. (3) This refers to suits under 28 U.S.C. 1331, where jurisdiction arises under the Constitution of the United States, an amendment to the Constitution, an act of Congress or a treaty of the United States. In cases where the U.S. is a party, the U.S. plaintiff or defendant code takes precedence, and box 1 or 2 should be marked.
Diversity of citizenship. (4) This refers to suits under 28 U.S.C. 1332, where parties are citizens of different states. When Box 4 is checked, the citizenship of the different parties must be checked. (See Section III below**; NOTE: federal question actions take precedence over diversity cases.**)

III. **Residence (citizenship) of Principal Parties.** This section of the JS 44 is to be completed if diversity of citizenship was indicated above. Mark this section for each principal party.

IV. **Nature of Suit.** Place an "X" in the appropriate box. If the nature of suit cannot be determined, be sure the cause of action, in Section VI below, is sufficient to enable the deputy clerk or the statistical clerk(s) in the Administrative Office to determine the nature of suit. If the cause fits more than one nature of suit, select the most definitive.

V. **Origin.** Place an "X" in one of the six boxes.
Original Proceedings. (1) Cases which originate in the United States district courts.
Removed from State Court. (2) Proceedings initiated in state courts may be removed to the district courts under Title 28 U.S.C., Section 1441. When the petition for removal is granted, check this box.
Remanded from Appellate Court. (3) Check this box for cases remanded to the district court for further action. Use the date of remand as the filing date.
Reinstated or Reopened. (4) Check this box for cases reinstated or reopened in the district court. Use the reopening date as the filing date.
Transferred from Another District. (5) For cases transferred under Title 28 U.S.C. Section 1404(a). Do not use this for within district transfers or multidistrict litigation transfers.
Multidistrict Litigation. (6) Check this box when a multidistrict case is transferred into the district under authority of Title 28 U.S.C. Section 1407. When this box is checked, do not check (5) above.

VI. **Cause of Action.** Report the civil statute directly related to the cause of action and give a brief description of the cause. **Do not cite jurisdictional statutes unless diversity.** Example: U.S. Civil Statute: 47 USC 553 Brief Description: Unauthorized reception of cable service

VII. **Requested in Complaint.** Class Action. Place an "X" in this box if you are filing a class action under Rule 23, F.R.Cv.P.
Demand. In this space enter the actual dollar amount being demanded or indicate other demand, such as a preliminary injunction.
Jury Demand. Check the appropriate box to indicate whether or not a jury is being demanded.

VIII. **Related Cases.** This section of the JS 44 is used to reference related pending cases, if any. If there are related pending cases, insert the docket numbers and the corresponding judge names for such cases.

Date and Attorney Signature. Date and sign the civil cover sheet.