

Certificate of Analysis

Vetoquinol

| | | | |
|----------------------------|--------------------------|--------------------------|---------------------|
| Sample Name: | UC-II Powder | Covance Sample: | 7444172 |
| Project ID | VETOQUINOL-20180629-0001 | Receipt Date | 29-Jun-2018 |
| PO Number | CVD | Receipt Condition | Ambient temperature |
| Lot Number | 1801011 | Login Date | 29-Jun-2018 |
| Sample Serving Size | | Online Order | 10 |

| Analysis | Result |
|--|---------------|
| Amino Acids | |
| Hydroxyproline | 3410 mg/100g |
| Collagen | 27300 mg/100g |
| Bacillus cereus Plate Count on MYP agar | |
| Presumptive Bacillus cereus group | <100 CFU/g |
| Undenatured Type-II collagen-ELISA method * | |
| Undenatured Type-II Collagen | 6.61 % |

| Method References | Testing Location |
|-------------------|------------------|
|-------------------|------------------|

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|------------------------------|---------------------------------------|
| Amino Acids (TAALC_S) | Covance Laboratories - Madison |
|------------------------------|---------------------------------------|

R. Schuster, "Determination of Amino Acids in Biological, Pharmaceutical, Plant and Food Samples by Automated Precolumn Derivatization and HPLC", Journal of Chromatography, 1988, 431, 271-284.

Henderson, J.W., Ricker, R.D. Bidlingmeyer, B.A., Woodward, C., "Rapid, Accurate, Sensitive, and Reproducible HPLC Analysis of Amino Acids, Amino Acid Analysis Using Zorbax Eclipse-AAA columns and the Agilent 1100 HPLC," Agilent Publication, 2000. Barkholt and Jensen, "Amino Acid Analysis: Determination of Cysteine plus Half-Cystine in Proteins after Hydrochloric Acid Hydrolysis with a Disulfide Compound as Additive", Analytical Biochemistry, 177, 318-322 (1989).

Henderson, J.W., Brooks, A., "Improved Amino Acid Methods using Agilent Zorbax Eclipse Plus C18 Columns for a Variety of Agilent LC Instrumentation and Separation Goals," Agilent Application Note 5990-4547 (2010).

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| Bacillus cereus Plate Count on MYP agar (BCERPC_MYP) | Covance Laboratories - Madison NE |
|---|--|

Tallent, S. M., Rhodehamel, E. J., Harmon, S. M., and Bennett, R. W., "Chapter 14 - *Bacillus cereus*," *Bacteriological Analytical Manual*, Eighth Ed., Revision A, U. S. Food and Drug Administration: Silver Spring, MD (1998), Revised Feb 2012.

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|--|---------------------------------------|
| Undenatured Type-II collagen-ELISA method (MISC_4027) | Covance Laboratories - Madison |
|--|---------------------------------------|

Client Supplied: UC-II Raw Materials Method

* This analysis is not ISO accredited.

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Testing Location(s)

Released on Behalf of Covance by

Covance Laboratories - Madison

Covance Laboratories Inc.
3301 Kinsman Blvd
Madison WI 53704
800-675-8375

Edward Ladwig - Director



2918.01

Covance Laboratories - Madison NE

Covance Laboratories Inc.
2102 Wright Street
Madison WI 53704
800-675-8375

Richard Higby - Director



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These results apply only to the items tested. This certificate of analysis shall not be reproduced, except in its entirety, without the written approval of Covance.



Certificate of Analysis

UC-II Powder

Lot No: 1801011

UC-II® is a standardized cartilage with undenatured (native) Type II collagen in powder form for use as a dietary supplement (U.S. Patents 7,083,820, 7,846,487, EPO Patent EP1435906B1, U.S. and worldwide patents pending).

| | | | |
|-----------------|-----------|----------------------|--------------|
| Lot No: | 1801011 | Country of Origin: | USA |
| Date of Report: | 2/13/2018 | Date of Manufacture: | January 2018 |
| Product ID: | UC-II | Product Code: | FG21020 |

Excipients: Potassium Chloride

Shelf Life : 3 years when stored in tightly closed containers free of excessive heat, moisture, light and air.

TEST RESULTS

| No. | Tests | Specification | Results | Methodology |
|---------------------------|---------------------------------------|------------------|----------|-------------------------|
| PHYSICAL | | | | |
| 1. | Color | White / Cream | Complies | Visual |
| 2. | Density, Bulk (g/cc) | 0.45 - 0.75 | 0.60 | USP <616> |
| 3. | Density, Tap (g/cc) | 0.75 - 1.05 | 0.88 | USP <616> |
| 4. | Identification | Matches Standard | Complies | USP <197> |
| 5. | Loss on Drying (%) | ≤ 10 | 7.1 | USP <731> |
| <i>Particle Size</i> | | | | |
| 6. | Weight % thru 100 Mesh | ≥ 60 | 70.1 | USP <786> |
| CHEMICAL | | | | |
| 7. | Potassium (%) | 14.2 - 19.4 | 14.9 | USP <730> |
| <i>Active Ingredients</i> | | | | |
| 8. | Total Collagen (%) | ≥ 25 | 29 | HPLC |
| 9. | Undenatured Type II Collagen (%) | ≥ 3 | 10.3 | ELISA |
| <i>Heavy Metals</i> | | | | |
| 10. | Arsenic (ppm) | ≤ 1.5 | < 0.5 | USP <730> |
| 11. | Cadmium (ppm) | ≤ 0.5 | < 0.2 | USP <730> |
| 12. | Lead (ppm) | ≤ 1.0 | < 0.1 | USP <730> |
| 13. | Mercury (ppm) | ≤ 0.5 | < 0.1 | USP <730> |
| MICROBIOLOGICAL | | | | |
| 14. | Bacillus Cereus, cfu/g | < 1000 | < 100 | FDA-BAM, 8th Ed, Ch. 14 |
| 15. | Enterobacterial Count, MPN/g | < 10 | < 10 | USP <2021> |
| 16. | Escherichia coli | Absent | Absent | USP <2022> |
| 17. | Salmonella | Absent | Absent | USP <2022> |
| 18. | Staphylococcus Aureus | Absent | Absent | USP <2022> |
| 19. | Total Aerobic Microbial Count (cfu/g) | ≤ 3000 | 250 | USP <2021> |
| 20. | Total Molds & Yeast Count (cfu/g) | ≤ 100 | < 100 | USP <2021> |

Confirmation that specification data from independent laboratory is accurately disclosed on this Certification of Analysis.


 By: Tyran Richards Head of Quality/Designee Approval Date: 2/13/18