

Clinical trials and scientific studies of RADIANCE active ingredients

| Clinical trials | Institutes / location | Trial design | Study type |
|--|---|---|----------------|
| Selected Clinical trials of RADIANCE a.i. | Souken institute Tokyo Japan | Trial objective: Improvement of skin conditions Duration: 8 weeks trial in October to December Double-blind vs placebo 33 women with dry skin conditions Age 40-59 years | Clinical trial |
| | Dermscan institute Lyon France | Trial objective: Anti-wrinkle effect and biomechanical properties Duration: 12 weeks in October to January Double-blind vs placebo 47 women with normal to dry skin Age 35-55 years | |
| | Cosderma laboratories Bordeaux France | Trial objective: Skin collagen restructure and anti-ageing effect Duration: 12weeks Double-blind vs placebo 106 women Age 40-65 years | |

| Product active ingredient | Study area | Function | Source | Study type |
|---------------------------|--------------------------------|--|--|------------|
| RADIANCE | Bioactivity & bio-availability | Quick Bloodstream entry | Ichikawa, S. et al., 2010, Hydroxyproline-containing dipeptides and tripeptides quantified at high concentration in human blood after oral administration of gelatine hydrolysate. International Journal of Food Sciences and Nutrition, 61(1):52-60 | In vivo |
| | | | Shigemura, Y. et al., 2014, Dose-dependent changes in the levels of free and peptide forms of hydroxyproline in human plasma after collagen hydrolysate ingestion. Food Chemistry, 159:328-332 | In vivo |
| | Absorption | Watanabe-Kamiyama M. et al., 2010, Absorption and effectiveness of orally administered low molecular weight collagen hydrolysate in rats. Journal of Agricultural and Food Chemistry, 58:835-841 | In vivo | |
| | | Gong et al. Wei Sheng Yan Jiu. 1998 Nov 30;27(6):402-4. | in vivo | |

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|---------------------------|------------|---|---|---|
| RADIANCE | Skin | Skin moisture Collagen defragmentation | Asserin, J. et al., 2015, The effect of oral collagen peptide supplementation on skin moisture and the dermal collagen network: evidence from an ex vivo model and randomized, placebo-controlled clinical trials. Journal of Cosmetic Dermatology, 14:291-301. doi: 10.1111/jocd.12174 | Clinical trial 33 Japanese women with dry skin condition Age 40-59y 2month study |
| | | Collagen defragmentation | Asserin, J. et al., 2015, The effect of oral collagen peptide supplementation on skin moisture and the dermal collagen network: evidence from an ex vivo model and randomized, placebo-controlled clinical trials. Journal of Cosmetic Dermatology, 14:291-301. doi: 10.1111/jocd.12174 | Clinic trial 106 Caucasian women with photoaging I-IV condition Age 40-65 2month study |
| | | Increase skin elasticity | Campos, Mbg, P. M. et al., 2015, An Oral Supplementation Based on Hydrolyzed Collagen and Vitamins Improves Skin Elasticity and Dermis Echogenicity: A Clinical Placebo-Controlled Study. Clinical Pharmacology & Biopharmaceutics, 04(03) | Clinical study 60 women with photo type II-IV Age 40-60y 90 days study |
| | | Anti-aging wrinkle reduce moisture increase collagen density increase | Borumand, M. et al., 2014, Daily consumption of the collagen supplement Pure Gold Collagen® reduces visible signs of aging. Clinical Interventions in Aging, 9:1747-1758 | Clinical trial 300 men and women Age 18-74y 60days, 130days,180days studies |
| | | Collagen and hyaluronic acid production | Asserin, J. et al., 2015, The effect of oral collagen peptide supplementation on skin moisture and the dermal collagen network: evidence from an ex vivo model and randomized, placebo-controlled clinical trials. Journal of Cosmetic Dermatology, 14:291-301. doi: 10.1111/jocd.12174 | Ex vivo |

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| RADIANCE | Skin | Collagen renewal | Postlethwaite, A. E. et al., 1978, Chemotactic attraction of human fibroblasts to type I, II, and III collagens and collagen-derived peptides. Proceedings of the National Academy of Sciences, 75(2):871-875 | in vitro |
| | | | Shigemura, Y. et al., 2009, Effect of Prolyl-hydroxyproline (Pro-Hyp), a Food-Derived Collagen Peptide in Human Blood, on Growth of Fibroblasts from Mouse Skin. Journal of Agricultural and Food Chemistry, 57(2):444- 449 | in vitro |
| | | | Ohara, H. et al., 2010, Effects of Pro-Hyp, a Collagen Hydrolysate- Derived Peptide, on Hyaluronic Acid Synthesis Using in Vitro Cultured Synovium Cells and Oral Ingestion of Collagen Hydrolysates in a Guinea Pig Model of Osteoarthritis. Bioscience, Biotechnology, and Biochemistry, 74(10):2096-2099 | in vitro |
| | Increase skin strength | | Matsuda, N. et al., 2006, Effects of Ingestion of Collagen Peptide on Collagen Fibrils and Glycosaminoglycans in the Dermis. Journal of Nutritional Science and Vitaminology, 52(3):211-215 | in vivo (animal) |
| | | | Liang, J. et al., 2010, The Protective Effects of Long-Term Oral Administration of Marine Collagen Hydrolysate from Chum Salmon on Collagen Matrix Homeostasis in the Chronological Aged Skin of Sprague-Dawley Male Rats. Journal of Food Science, 75(8) | in vivo (animal) |

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| RADIANCE | Skin | Riboflavin function to skin health | Roe DA, 1991. Riboflavin deficiency: mucocutaneous sign of acute and chronic deficiency. <i>Seminars in Dermatology</i> , 10, 293–295. | Scientific studies |
| | | | Powers HJ, 2003. Riboflavin (vitamin B-2) and health. <i>American Journal of Clinical Nutrition</i> , 77, 1352-1360. | |
| | | | Rivlin RS, 2007. Riboflavin (vitamin B2). In: <i>Handbook of Vitamins</i> . Eds Rucker R, Zempleni J, Suttie, JW and McCormick DB. CRC Press, Boca Raton, 241 – 242. | |
| | | | Sadler MJ, Strain JJ and Caballero B, 1999. <i>Encyclopaedia of Human Nutrition</i> , Academic Press, San Diego, 100-108. | |
| | | | Hoey L, McNulty H and Strain JJ, 2009. Studies of biomarker responses to intervention with riboflavin: a systematic review. <i>American Journal of Clinical Nutrition</i> , 89, 1960S-1980S | |
| | | | Miyazawa T, Sato C and Kaneda T, 1983. Antioxidative effects of α -tocopherol and riboflavin- butyrate in rats dosed with methyl linoleate hydroperoxide. <i>Agricultural and Biological Chemistry</i> , 47, 1577–1582. | |
| | | | Taniguchi M and Hara T, 1983. Effects of riboflavin and selenium deficiencies on glutathione and related enzyme activities with respect to lipid peroxide content of rat livers. <i>Journal of Nutritional Science and Vitaminology</i> , 29, 283-292. | |

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| RADIANCE | Skin | Niacin function to skin health | King JC and Cousins RJ, 2006. Zinc. In: Modern Nutrition in Health and Disease. Eds Shils M, Shike M, Ross C, Caballero B and Cousins R. Lippincott Williams & Wilkins, Baltimore, Philadelphia, 271-285. | Scientific studies |
| | | | Jacob RA, 2006. Niacin. In: Present Knowledge in Nutrition. Bowman BA and Russell RM (eds.). International Life Sciences Institute (ILSI), Washington, DC, 260-268. | |
| | | | Institute of Medicine (IoM), 2000. Dietary Reference Intakes for thiamin, riboflavin, niacin, vitamin B6, folate, vitamin B12, pantothenic acid, biotin and choline. Washington DC. National Academies Press. | |
| | | | SCF (Scientific Committee on Food). Opinion of the Scientific Committee on Food on the tolerable upper intake levels of nicotinic acid and nicotinamide (niacin) (expressed on 17 April 2002). | |
| | | | SCF (Scientific Committee on Food). Nutrient and energy intakes for the European Community. Reports of the Scientific Committee on Food (Thirty-first series). Luxembourg 1993. | |
| | | | Bourgeois C, Cervantes-Lauren D, Moss J, 1999. Niacin. In: Modern Nutrition in Health and Disease. Shils ME, Shike M, Ross CA, Caballero B, Cousins RJ (eds.). Williams & Wilkins, Baltimore, 442-451. | |
| | | | Expert Group on Vitamins and Minerals (EVM), 2002. Review of Niacin. Revised Version. | |

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| RADIANCE | Skin | Biotin function to skin health | Mock DM, 1991. Skin manifestations of biotin deficiency. <i>Semin Dermatol</i> , 10, 296-302. | Scientific studies |
| | | | Mock DM, 2005. Biotin. In: <i>Encyclopaedia of Human Nutrition</i> . Caballero B, Allen L, Prentice A (eds.). Elsevier, Oxford. | |
| | Hair and nail | Niacin function to hair and nail health | El-Fekih N, Badri T, Kharfi M, Zeglaoui F, Fazaa B, Gaiji S, Kamoun MR, 2005. Diffuse alopecia and diet. <i>Dermatol Clin</i> , 25, 101-105. | Scientific studies |
| | | | Raoudi M and Robreau Y, 2006. Evaluation of the acceptability of dietary supplement RV1586D - DA0230 intended to fight against hair loss. Performed by PharmaScan, 69 603 Villeurbanne, France (unpublished). | |
| | | Biotin function to hair health | Floersheim GL, 1992. Prüfung der Wirkung von Biotin auf Haarausfall und Haarqualität. <i>Z Hautkr</i> 67, 246-255. | |
| | Biotin function to nail health | | Floersheim GL. Treatment of brittle fingernails with biotin. <i>Z Hautkr</i> . 1989;64(1):41-8. | Scientific studies |
| | | | Hochman LG, Scher RK, Meyerson MS. Brittle nails: response to daily biotin supplementation. <i>Cutis</i> . 1993;51(4):303-5. | |
| | | | Colombo VE, Gerber F, Bronhofer M, et al. Treatment of brittle fingernails and onychoschizia with biotin: scanning electron microscopy. <i>J Am Acad Dermatol</i> . 1990;23(6 Pt 1):1127-32. | |

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| RADIANCE | Hair and nail | Collagen effect to nail health | Proksch E, Segger D, Degwert J, et al. Oral supplementation of specific collagen peptides has beneficial effects on human skin physiology: a double-blind, placebo-controlled study. <i>Skin Pharmacol Physiol</i> . 2014;27:47-55. | Scientific studies |
| | | | Van De Kerkhof PCM, Pasch MC, Scher RK, et al. Brittle nail syndrome: a pathogenesis-based approach with a proposed grading system. <i>J Am Acad Dermatol</i> . 2005;53:644-651. | |
| | | | Le Vu P, Takatori R, Iwamoto T, et al. Effects of food-derived collagen peptides on the expression of keratin and keratin-associated protein genes in the Mouse Skin. <i>Skin Pharmacol Physiol</i> . 2015;28:227-235. | |
| | | | Shimizu J, Asami N, Kataoka A, et al. Oral collagen-derived dipeptides, prolyl-hydroxyproline and hydroxypropyl-glycine, ameliorate skin barrier dysfunction and alter gene expression profiles in the skin. <i>Biochem Biophys Res Commun</i> . 2015;456:626-630. | |
| | | | Oba C, Ohara H, Morifuji M, et al. Collagen hydrolysate intake improves the loss of epidermal barrier function and skin elasticity induced by UVB irradiation in hairless mice. <i>Photodermatol Photoimmunol Photomed</i> . 2013;29:204-211. | |