



## Use of Undenatured Chicken Sternal Collagen Type II for Oral Tolerization

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The process of age-related deterioration of the joint tissue associated with normal wear and tear is capable of triggering an immune system

response. This response is aimed at particular collagen structures in the joint tissue that are typically inaccessible by the immune cells and are not supposed to produce an immune response. A particular class of T-cells is a likely suspect of this reaction that might hinder normal healing and the restorative process in the joints and exacerbate discomfort complaints in affected joints.<sup>1</sup>

Glucosamine and chondroitin have become supplements of choice for supporting joint health. However, their mechanism of action is limited to providing structural elements for re-building deteriorated joint tissue.<sup>2</sup> When mechanical wear and tear triggers further deterioration via immune system response, it is much harder to support cartilage re-synthesis without controlling the severity of the inflammatory process.

Recently, it has been shown that it is possible to condition the immune system's reactivity to collagen via a process called **oral tolerization**. The concept of oral tolerization has been developed over the last few decades all over the world. It was boosted by recent clinical and immunological advances that gave us a better understanding of how oral tolerization brings about the calming of collagen-reactive T-cell activity. More specifically, it is a class of NK (natural killer) cells that is capable of developing the immune reactivity to collagen.<sup>3,4</sup>

Introduction of certain collagen structures via an oral route has been shown to regulate immune reactivity of NK cells to collagen in the tissues. The particular structures responsible for such an effect have been identified as peptide sequences attached to a collagen molecule and named tolerogenic epitopes. It has been established that when chicken sternal collagen type II is carefully prepared without excessive heat, pressure or chemical hydrolysis, it preserves its natural triple-helix configuration with tolerogenic epitopes intact making it suitable for oral tolerization.<sup>5</sup> However, standard conventional processing renders it denatured and immunologically inactive, although having the same amino acid profile as the native collagen.

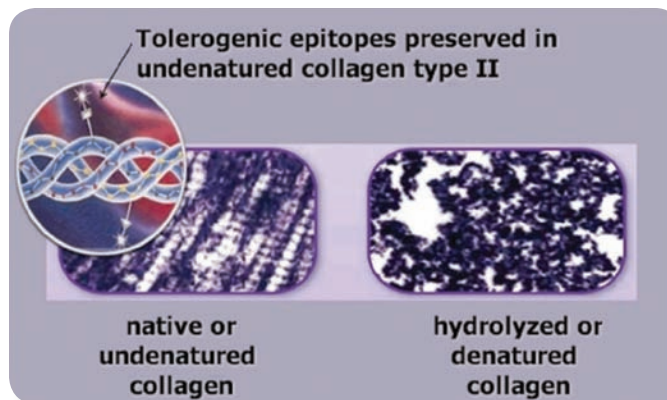


Fig.1. Structural and tolerogenic differences vary depending on the preparation method of collagen

Supplementation with undenatured chicken collagen type II has been a subject of animal studies and clinical trials. They revealed that the establishment of the effective dose in the case of oral tolerization does not follow typical principals of the dose-effect relationship. Similar to vaccination, only a few milligrams of the antigenic (or in this case, tolerogenic) compound are necessary for the desired immune system conditioning. In fact, using more of the tolerogenic compound produces less of the desired calming effect on the collagen-reactive T-cells.<sup>1,3</sup>

UC•II® is a trademarked name for undenatured chicken collagen type II produced according to the criteria described above. The preparation process is crucial for preserving tolerogenic epitopes and ultimately, making the collagen suitable for conducting oral tolerization.<sup>6</sup> UC•II® (40 mg/day, delivering 10 mg of tolerogenic collagen) has been clinically validated for its ability to reduce discomfort in age-related deteriorated joints. In this trial, it outperformed glucosamine/chondroitin combination (1500mg/1200mg/day) producing a statistically significant difference between the groups in 90 days using three different assessment tools: WoMAC™ (The Western Ontario and MacMaster University Osteoarthritis Index), VAS (Visual Analogue Scale) and Lequesne's functional index (Fig.2).

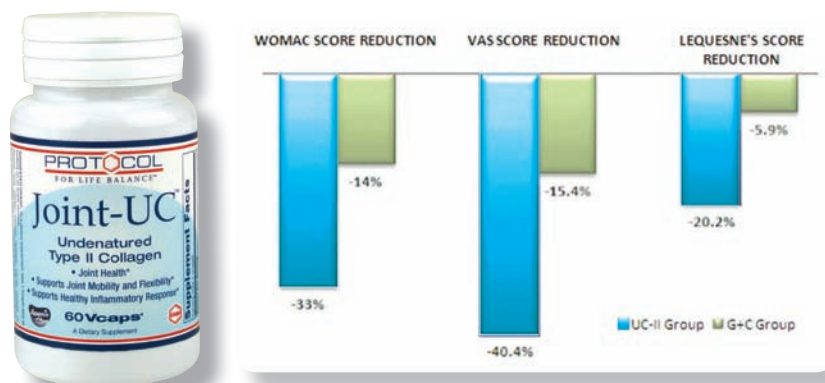


Fig.2. Reduction in assessment scores after 90 days of supplementation with UC•II® or glucosamine+chondroitin supplementation in individuals with knee pain.

Oral tolerization with undenatured chicken sternal collagen type II offers new possibilities for nutritional intervention and supplementation in individuals with age-related deterioration of joint tissue associated with normal wear and tear. Its mechanism of action is completely different from that of glucosamine and chondroitin. Thus, they could be used complimentary. UC•II® also has an excellent safety record as documented in the randomized double-blind clinical trial in 52 patients.<sup>6</sup>

References available upon request

**New!**

## Joint-UC™ with UC•II®



Derived from chicken sternum cartilage, UC•II® consists of Undenatured (native) Type II Collagen that works with the immune system to support healthy joints and promote joint mobility and flexibility via a mechanism not shared by any other joint health supplement.\* Joint-UC™ promotes the maintenance of healthy joints by a process called "oral tolerization." This describes a process by which the immune system is conditioned to minimize its response to the elements that are normally found in the joint tissue. These elements, which are tolerated in healthy tissue, can provoke an immune response when those tissues are subjected to everyday wear and tear. UC•II's patent protected composition has demonstrated its efficacy in human clinical studies.\* Joint-UC™ is enhanced with Aquamin® Red Algae Minerals, a natural whole-food source of calcium and over 70 trace minerals.

There are many natural joint products on the market, but Joint-UC™ distinguishes itself from the others. Joint-UC™ contains UC•II®, an ingredient that works through an entirely different mechanism. UC•II® does not work against the body's natural defenses; instead, it works with the immune system to maintain healthy joint tissue.\* UC•II® supports a balanced, healthy immune response to joint stress resulting from normal everyday wear and tear.\* Clinical studies have demonstrated that UC•II® is effective in helping to alleviate minor pain and support joint mobility and flexibility.\*

- Unique Approach to Joint Health\*
- Undenatured Type II Collagen
- with Aquamin® Red Algae Minerals
- Supports Joint Mobility and Flexibility\*

### Supplement Facts

Serving Size 1Vcap®

	Amount Per Serving
UC•II® Standardized Chicken Cartilage <sup>1</sup> (Providing 10mg Undenatured Type II Collagen)	40 mg*
Aquamin® F (as Mineralized Red Algae Sea Minerals) ( <i>Lithothamnium corallioides/Lithothamnium</i> ) (Whole Plant)	250 mg*

**New!**

## Cardio Tri-Plex™



Cardio Tri-Plex™ is a novel blend of Red Yeast Rice (RYR), CoQ10 and Omega-3 from fish oil. RYR is a traditional Chinese culinary ingredient created by combining *Monascus purpureus* with fermented rice. It has been used in China for over 1,000 years as a food preservative, natural colorant, and in the production of red rice wine and red bean curd, as well as by traditional herbalists for many other purposes. A dietary staple in certain Asian countries, RYR is consumed in some areas at estimated levels of 14-55 grams per day per person. The extracts from RYR contain starch, sterols, isoflavones, monounsaturated fatty acids, and other compounds that contribute to overall health.\* The Red Yeast Rice in Protocol For Life Balance™ Cardio Tri-Plex™ is carefully selected to avoid the presence of citrinin, a sometimes toxic by-product of the fermentation process. Cardio Tri-Plex™ also contains pharmaceutical-grade Coenzyme Q10 (CoQ10), a compound well-known for its key role in cellular energy production, as well as its potent antioxidant properties and, most importantly, its vital importance to healthy cardiovascular function. The third component in Cardio Tri-Plex™ is Omega-3 from fish oil, which supports healthy cardiovascular function as well as a balanced, healthy inflammatory response.

- Cardiovascular Support\*
- Red Yeast Rice
- CoQ10
- Omega-3 Fish Oil

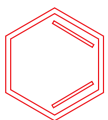
### Supplement Facts

Serving Size 2 Softgels

	Amount Per Serving
Vitamin E (as natural d-alpha Tocopherol)	20 IU
<b>Natural Fish Oil Concentrate</b>	<b>2.0 g (2,000 mg)</b>
<b>Omega-3 Fatty Acids</b>	<b>600 mg</b>
Eicosapentaenoic Acid (EPA)	360 mg
Docosahexaenoic Acid (DHA)	240 mg
<b>Organic Red Yeast Rice (<i>Monascus purpureus</i>)</b>	<b>600 mg</b>
<b>CoQ10 (Coenzyme Q10)</b>	<b>60 mg</b>

Code	Products	Size
P0105	5-HTP 100 mg	90 Vcaps®
P0108	5-HTP 200 mg + Tyrosine	60 Vcaps®
P1811	A - Biotic™ Enteric Coated, Potent	60 Gels
P0076	Acetyl-L-Carnitine 500 Vcaps®	100 Vcaps®
P3344	Adrenal Cortisol Support™	90 Vcaps®
P3032	AHCC® 500 mg Vcaps®	60 Vcaps®
P3282	Aller-All™ Seasonal Support	60 Tabs
P3036	Aloe Vera 5,000 Softgels	100 Gel
P3042	Alpha Lipoic Acid 250 mg	90 Vcaps®
P3046	Alpha Lipoic Acid 600 mg Plus	60 Vcaps®
P2958	BioCore® Enhanced Enzymes	90 Vcaps®
P0471	Biotin 5000 mcg Vcaps®	90 Vcaps®
P1228	Bone Strength™	180 Caps
P1720	Borage/GLA 1050 mg	60 Gels
P3303	Brain Regain™	60 Vcaps®
P3063	Brocco Immune™	60 Vcaps®
P2943	Bromelain 2400 gdu/500 mg	90 Vcaps®
P1268	Cal-Mag, Liquid, Lemon	16 oz
P3308	C.Away™	90 Vcaps®
P1675	CardioTri-Plex™ <b>NEW!</b>	120 Gels
P0072	L-Carnitine 500 mg Carnipure®	60 Caps
P3019	Celadrin® Joint Liposome Lotion	4 oz
P9470	Protocol Celadrin® Tabletop Display <b>NEW!</b>	12 Bottles
P1415	ChromeMate® 200 mcg	90 Caps
P1731	CLA Away™	90 Gels
P0405	CoEnzyme B Complex	60 Tabs
P3163	CoQ10 60 mg + Fish Oils	90 Gels
P3208	CoQ10 100 mg Softgels	90 Gels
P3196	CoQ10 200 mg Lozenges	60 Loz
P3198	CoQ10 400 mg Softgels	60 Gels
P3182	CoQ10 600 mg Softgels	60 Gels
P3185	CoQ10 Liquid 100 mg/tsp	1 oz
P3186	CoQ10 Liquid 100 mg/tsp	4 oz
P3158	CoQ10 100% Pure Powder	1 oz/28g
P4632	Cranberry Stand. 6%/Uva Ursi	90 Vcaps®
P4638	Curcumin 665 mg 95% Extract	60 Vcaps®
P3121	D-Flame™ Cox-2 Formula	90 Vcaps®
P2811	D-Mannose Urinary 500 mg	90 Caps
P2956	Dairy Digestion™	90 Vcaps®
P4704	EGCg 400 mg/50%	90 Vcaps®
P1770	Flax Seed Oil 1000 mg Organic	120 Gels
P0498	Flush Free Niacin 500 mg	90 Vcaps®
P4683	Ginkgo Biloba 120 mg/24% Plus	100 Vcaps®
P3048	GliSODin® 100 mg/Wheat Grass	90 Vcaps®
P3170	Gluc/Chond/MSM Caps	90 Caps
P3172	Gluc/Chond/MSM Caps	180 Caps
P3243	Gluc/Chond 2 per day, Extra Strength	120 Tab
P3130	Gluc & MSM, Vegetarian 1000 mg	120 Vcaps®
P3175	Liquid Glucosamine, Chond, MSM	16 oz
P3318	Glucose Balance™	90 Caps
P0094	L-Glutamine 1000 mg	120 Caps
P3274	Grape Seed OPC 250 mg Extract	90 Vcaps®
P3055	Immune Renew™ (Org. Mushrooms)	90 Vcaps®
P3134	Joint UC Collagen <b>NEW! (June)</b>	60 Vcaps®
P1625	Krill Oil 500 mg <b>NEW!</b>	60 Gels
P2448	Liver Detox™ - Dr. Verghese	90 Caps
P3062	LYC-O-MATO® 20 mg Lycopene	60 Gels
P3258	Melatonin 3 mg Lozenge & B-6	120 Loz
P3326	MetaboEnergetics™	90 Caps
P0495	Methyl B-12 1,000 mcg	100 Loz
P0496	Methyl B-12 5,000 mcg	60 Loz
P4739	Milk Thistle 300 mg/80% Plus	90 Vcaps®
P2120	MSM One Gram Caps	180 Caps

P0085	NAC N-acetyl cysteine 600 mg + Antioxidants	100 Caps
P3140	Nattokinase 100 mg/2000 FU units	60 Vcaps®
P3301	Ocu Support™ Clinical Strength	90 Caps
P1659	Omega-3 Lemon Liquid /Molecularly Distilled	7 oz
P1656	Omega-3/Enter 180/120 /Molecularly Distilled	90 Gels
P1657	Omega-3/Enter 180/120 /Molecularly Distilled	180 Gels
P1661	Ultra Omega-3 500/250/Molecularly Distilled	90 Gels
P3281	Ortho Detox™	90 Caps
P2912	Ortho Dophilus™ 8 Strains, 4 Billion	60 Vcaps®
P0950	Ortho-E™ NON-GE	60 Gels
P3788	Ortho Multi Green <b>NEW! (June)</b>	180 Vcaps®
P3772	Ortho Multi™ Liquid - Iron Free/Xylitol	16 oz
P3816	Ortho Multi™ Softgel w/ Flax 400 mg	90 Gels
P3878	Ortho Multi™ for Men Caps	90 Vcaps®
P3875	Ortho Multi™ for Men Tabs	90 Tabs
P3798	Ortho Multi™ for Women Caps	120 Vcaps®
P3796	Ortho Multi™ for Women Tabs	90 Tabs
P3340	Ortho Prostate™	90 Gels
P3368	Ortho Thyroid™	90 Vcaps®
P1413	OsteoBoron® 3 mg, Natural Form/base	90 Vcaps®
P0460	P-5-P 50 mg CoEnzyme B-6	60 Tabs
P0487	Pantethine 300 mg Co-enzyme A	60 Gels
P4727	Peppermint Oil G.I.™ Enteric	90 Gels
P3345	PepZin G.I.® Soothe™	60 Tabs
P2385	Phosphatidyl Serine 100 mg & Ginkgo 60 mg	60 Gels
P3338	Progesterone Cream Pump - 20 mg	3 oz
P5955	ProtoClear™ Berry Flavor	2.55 lbs
P5956	ProtoClear™ Berry Sample Packet	27.5 g
P5957	ProtoClear™ Orange Flavor	2.55 lbs
P5958	ProtoClear™ Orange Sample Packet	27.5 g
P5960	ProtoClear™ Vanilla Flavor <b>NEW!</b>	2.55 lbs
P5961	ProtoClear™ Vanilla Sample Packet <b>NEW!</b>	27.5 g
8931	ProtoClear™ Premium Shaker Cup <b>NEW!</b>	12 oz
P0716	ProtoSorb™ C 500	100 Vcaps®
P0726	ProtoSorb™ C 1000	100 Tabs
P3277	Pycnogenol® 60 mg & Rutin	50 Vcaps®
P3321	Red Yeast & CoQ10 30 mg, ALA	90 Vcaps®
P3500	Red Yeast Rice Extract 600	90 Vcaps®
P3353	Resveratrol 200 mg <b>NEW!</b>	60 Vcaps®
P0138	SAMe 200 mg Enteric + B Complex	60 Tabs
P4756	Saw Prostetio™ 320 mg/85-95% Extract	90 Gels
P1485	Selenium 200 mcg, Yeast-Free	90 Vcaps®
P2954	Serrazimes® 33 mg/20,000 units	90 Vcaps®
P1905	Slimaluma® Plus	60 Vcaps®
P6957	Stevia Complete Packets	100/box
P6955	Stevia Non-Bitter Liquid, Sweet	2 fl oz
P6960	Stevia Non-Bitter Powder, Sweet	1 oz
P3507	Sytrinol® Cholesterol Formula	60 Vcaps®
P0142	Taurine 1000 mg Caps	100 Caps
P3380	True Balance™ Multi	120 Caps
P0166	L-Tryptophan 500 mg	60 Vcaps®
P0167	L-Tryptophan 500 mg	120 Vcaps®
P0169	L-Tryptophan 1000 mg <b>NEW! (July)</b>	60 Tabs
P3145	Ubiquinol CoQH-CF™ 50 mg	60 Gels
P3123	Vein Integrity™ with Trunorin®	90 Vcaps®
P2168	Virility For Men with LJ100®	60 Vcaps®
P0452	Vitamin B-12 Liquid Tri-Formula 5,000 mcg	4 oz
P0690	Vitamin C-1000 Cap+100 Bioflavonoids	120 Caps
P0365	Vitamin D-3 1,000 IU, Natural	120 Gels
P0367	Vitamin D-3 2,000 IU, Natural	120 Gels
P0372	Vitamin D-3 5000 IU, Natural <b>NEW!</b>	120 Gels
P0370	Liquid Vitamin D-3 5000 IU, Natural <b>NEW!</b>	2 oz
P0906	Vitamin E-400 20% Mixed + Selenium	120 Gels



**Our Mission:** Healthy Patients, Satisfied Physicians

**New!**

## Resveratrol 200 mg

- *Mega Potency / Cardiovascular Support\* / Vegetarian Formula*
- *With Red Wine Extract*
- *200 mg of Trans-Resveratrol*



The popularity of Resveratrol continues to increase. An article published in the November 2006 issue of the Wall Street Journal, coupled with continued positive findings among some of the industry's most esteemed researchers, has helped generate new excitement among health-seeking consumers. Protocol For Life Balance™ Resveratrol contains only natural trans-Resveratrol – the most potent and effective source. Not only do we have the superior grade, we also offer one of the highest potencies available at prices that are very competitive.

Resveratrol is a polyphenol that is naturally found in the skin of red grapes, certain berries, and other plants. Scientific studies have shown that Resveratrol supports healthy cardiovascular function through a variety of mechanisms.\* Resveratrol, especially when combined with other polyphenols, is known for its anti-aging effects, as well as for its ability to support a healthy inflammatory response.\* This is a 100% vegetarian product.

Protocol Resveratrol is ideal for those individuals concerned with supporting healthy cardiovascular activity, as well as anyone in a position to benefit from additional antioxidant protection.\*

Ingredients: Each Vcap® contains 200 mg of natural trans-Resveratrol and 10 mg of Red Wine Extract.

Suggested Use: As a dietary supplement, suggested use is two Vcaps® taken once to twice daily, with or without meals.

### Supplement Facts

Serving Size 1Vcap®

	Amount Per Serving
<i>Polygonum cuspidatum</i> Extract (Root) (50% Natural Trans-Resveratrol - 200 mg)	400 mg*
Red Wine Extract (Alcohol-Free) ( <i>vitis vinifera</i> ) (min. 30% Polyphenols)	10 mg*