

Collagen Supplementation  
for Skin - A New Paradigm

**An In-Depth Look at the Function and Efficacy of  
Relumins Premium Collagen Blend for Skin Care**



# Relumins Premium Collagen Blend

## Clinically Proven Benefits:

- ◇ Diminishes and/or prevents signs of aging
- ◇ Supports joint health and flexibility
- ◇ Supports protective skin barrier function
- ◇ Increases natural collagen production
- ◇ Reduces oxidative cell damage
- ◇ Reduces collagen degradation

## Ingredients:

- ◇ Actumarine Collagen
- ◇ L-Glutathione
- ◇ Hyaluronic Acid
- ◇ Vitamin C
- ◇ Pearl Coix Extract
- ◇ Glucosamine
- ◇ Green Tea Extract
- ◇ Vitamin B2
- ◇ CoQ10

## All Collagens are the Same, Right?

Anyone shopping in stores or online for skin care has likely seen dozens or even hundreds of collagen products promising incredible skin benefits. While decades of research on collagen supplementation back up these claims, do they all *really* work? The truth is, the quality and function of collagen varies greatly depending on the molecular profile of the collagen.

New studies show that for human health, collagen supplements should contain high levels of the hydroxyproline (HYP) peptide. Relumins Actumarine Collagen is derived from fish scales and skin, the best source for HYP collagen. Clinicians, estheticians, and practitioners choose this type of collagen over any other because their clients expect to see results quickly. With Relumins Premium Collagen Blend, results can be seen as quickly as 8 hours.

## So, why aren't all Collagen Supplements made this way?

The cost of high quality fish collagen can cost manufacturers up to 25 times more than cheaper animal collagens like Bovine and Porcine. The technology used to extract, purify and hydrolyze fish collagen is also significantly more sophisticated. Relumins sought out the most cutting edge producers of marine collagen and discovered a patented process only available in Japan to create their Actumarine Collagen.

## But I'm Under 40, do I Still Need Collagen?

Collagen peaks when you're still in the womb. Even in our 20s, our skin still experiences the same damaging stressors as when we are older. For lifelong healthy skin, hair and nails, it's never too early to add a high quality collagen to your diet.

## What is Collagen?

Collagen, the “structural skin super-protein”, is a hot topic of research in aesthetic dermatology due to its central role in anti-aging and skin repair. Collagen is composed of the amino acids Glycine, Proline, Arginine, and Hydroxyproline which are incorporated into collagen fibrils by fibroblasts in the skin, connective tissue and other organs. These fibrils bind to form long fibers with enormous tensile strength which provide structural support to

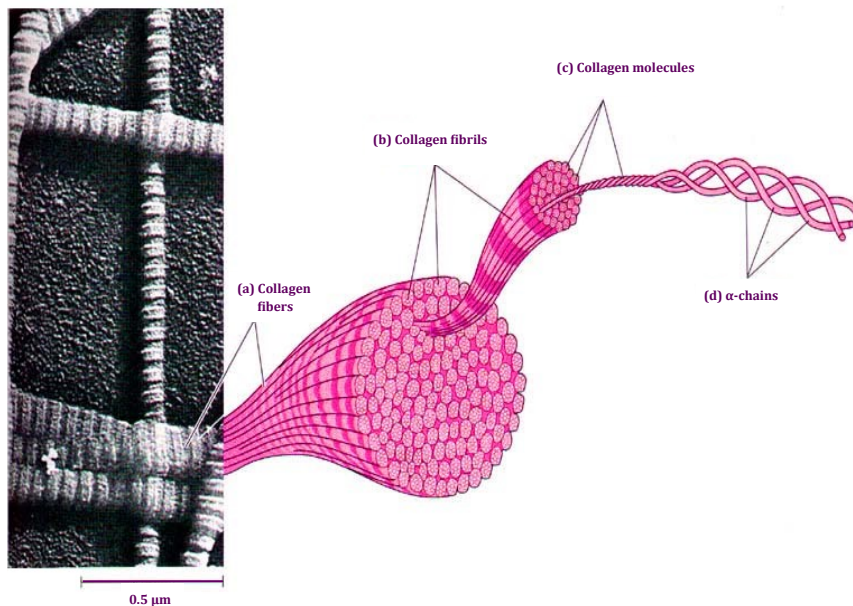
everything from our hair and skin to our bones and internal organs<sup>20</sup>.

Collagen is the primary source of rigidity in soft tissues. Its long fibrous structure can flex and bend and return back to its original shape. This allows us to have smooth, strong skin and youthful, flexible joints. It is so essential to the structure of our bodies and organs that it's no surprise collagen makes up 70% of skin protein and 30% of the body's total protein!

## Collagen Loss, Damage and Aging

Repair and production of collagen slow with age or from stresses and health conditions. These complex fibers are constantly taking damage and the body must keep up by synthesizing new collagen proteins to repair and rebuild them. Physical and chemical stressors such as skin wounds, burns or bone fractures lead to cascades that break apart the proteins into constituent peptides<sup>21</sup> while chemical stressors such as oxidative stress reduce the body's ability to regenerate<sup>22</sup>.

Stressors like acne and sunburn are common causes of repeated skin trauma. These stressors create inflammatory and oxidative stress within the cells. Collagen that is damaged by physical or chemical processes can be repaired, but the fibers will become thicker, inelastic and brittle. This weakened collagen doesn't provide the same flexibility and strength and is more prone to breaking down<sup>23</sup>.



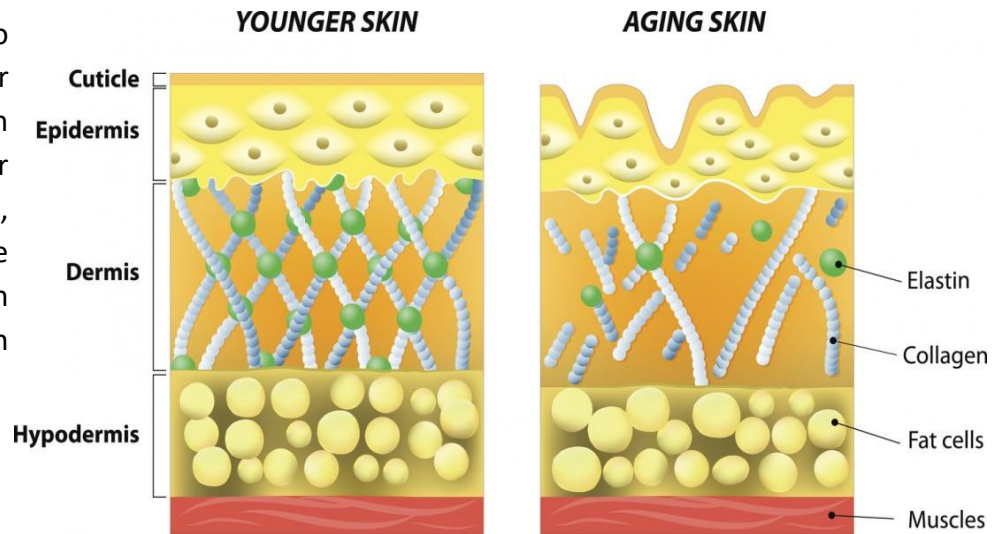
*Peptide chains (d) form triple helices (c) which bundle into fibrils (b) and ultimately the strong ropelike collagen fibers that provide structure and support to tissue (a)*

Loss of collagen leads to wrinkles, sagging and poor skin hydration along with stiff and achy joints. For youthful skin and joints, collagen needs to be maintained through supplementation, nutrition and protection.

### Efficacy of Oral Collagen Supplementation

The effectiveness of collagen peptides, the smallest molecular units of collagen, as an oral supplement for skin support has been documented in numerous studies. A 2008 study from Tokyo University of Agriculture & Technology looked at oral ingestion of the peptide at a dosage of 0.2 grams of collagen per kilogram of body weight per day. They demonstrated that it was effective at reducing or mitigating UV-B-induced skin damage such as decreases in skin hydration, hyperplasia of the epidermis, and decreases in soluble type I collagen<sup>24</sup>.

A 2008 literature review from the Archives of



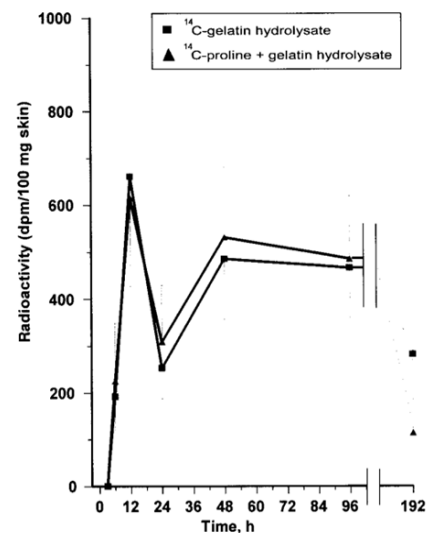
*Younger skin contains an abundance of well structured collagen fibers, supporting the outer layers of the skin. This results in smooth elastic skin.*

*Aged skin shows a collapse in collagen structure and abundance accompanied by a loss of elastin.*

Dermatological Research concluded, based on a number of clinical and preclinical studies, that oral ingestion of hydrolyzed collagen could achieve beneficial skin effects<sup>25</sup>.

Furthermore, Oesser, et. Al (1999) studied oral administration of <sup>14</sup>C labeled collagen in mice. They observed 95% absorption of collagen peptides within 12 hours of oral ingestion. Collagen content within skin cells peaked 12 hours after ingestion and remained elevated for 96 hours. This is strong evidence that points to a mechanism allowing the collagen

peptides to rush to where they are needed.

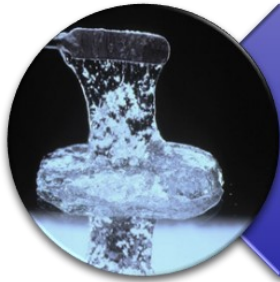


*(Oesser, et al 1999) Graph depicting collagen levels in mice which were given oral supplementation of HYP collagen peptides. The dramatic increase in skin collagen within 12 hours demonstrates collagen "rushing" to where it is needed.*



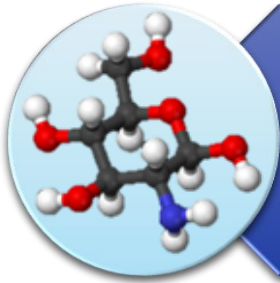
### ActuMarine™ Collagen

- Ultra-Pure, 100% Natural Marine Collagen for Maximum Bioavailability
- Tasteless/Odorless and Highly Soluble
- Improves Skin Moisture Level, Smoothness And Suppleness
- Prevents and Reverses Signs of Aging Like Fine Lines and Wrinkles



### Hyaluronic Acid

- Keeps Skin Plump and Hydrated
- Improves Skin's Barrier Functions
- Essential Component of Synovial Fluid and Cartilage, Keeping Joints Healthy and Protected



### Glucosamine

- Promotes Production Of Glycosaminoglycans Such As Hyaluronic Acid
- Whitens Skin by Inhibiting the Activity of Tyrosinase
- Prevents Skin Damage with Antioxidant and Anti-Inflammatory Properties
- Beneficial for Joint Health



### CoQ10

- Stimulates Natural Collagen Production
- Antioxidant and Anti-Inflammatory
- Promotes Longevity, Cell-Protection and Energy Production
- Can Help Whiten Skin



### Green Tea Extract

- Protects Skin from UV Induced Damage by Reducing Effects of Sunburn
- Delays the Aging of Collagen
- Antioxidant Molecules Protect Cells and Aid Skin Whitening

## Actumarine Collagen: Why it's Better

Relumins uses premium collagen derived from fish scales. The absorption properties of marine collagen differ from bovine or porcine collagens.

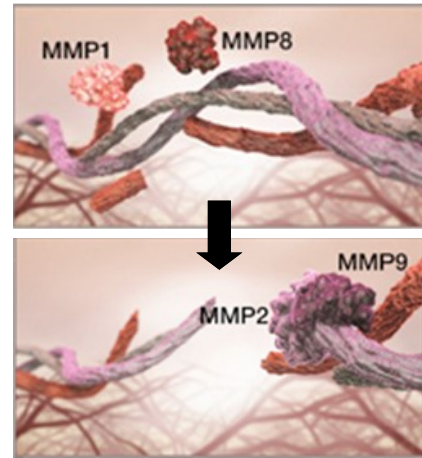
In a 2007 Japanese clinical study, researchers found that oral ingestion of fish scale collagen lead to substantial increases of hydroxyproline (hyp) and hyp-peptides in plasma<sup>2</sup>. This increase was significantly higher from fish scale collagen than from porcine collagen. Hydroxyproline is a major, essential component of collagen that permits the twisted, helical structure of the collagen proteins to remain structurally stable<sup>26</sup>.

The protein structure and content of fish collagen was also markedly different from other types of collagen. Ala-Hyp, Leu-Hyp, Ile-Hyp, Phe-Hyp, and Pro-Hyp-Gly were detected only with fish scale or fish skin gelatin hydrolysates<sup>2</sup>. Ala-Hyp-Gly and Ser-Hyp-Gly

were detected only with fish scale gelatin hydrolysate. These Hyp containing peptides are the most important functional peptides in collagen formation and maintenance.

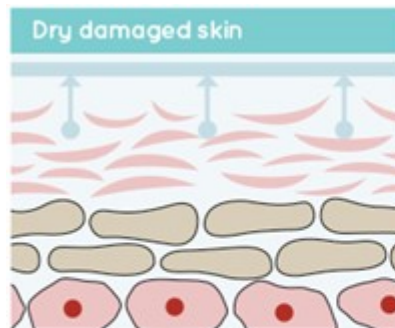
## Supporting Collagen Maintenance and Synthesis with Natural Compounds

There are many other ways to protect and restore collagen. There are several natural supplements that demonstrate marked effects when added to the diet. Relumins Collagen Blend contains a whole host of these ingredients: Vitamin C, Green Tea Extract, Hyaluronic Acid, CoQ10, Glucosamine, L-Glutathione, Acai Berry Extract and Pearl Coix Extract.

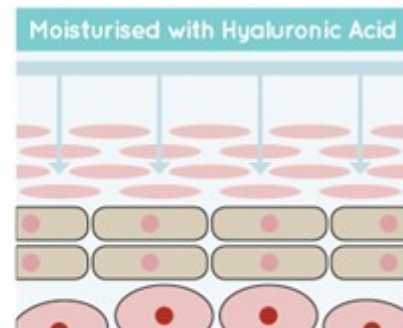


*Matrix Metalloproteinases (MMPs) destroy healthy collagen fibers leaving severe damage.*

Vitamin C is essential for the natural production of collagen. It directly activates the transcription of collagen synthesis and stabilizes procollagen mRNA<sup>3</sup>. It also inhibits the expression of Matrix Metalloproteinases (MMPs)<sup>4</sup>. Collagen is degraded by MMPs or other collagenase enzymes which are often



*Dry skin is uneven and irregular*



*Hyaluronic acid absorbs up to 1000x its own weight in water, keeping skin firm and healthy*

released as a result of oxidative or inflammatory activity.

CoQ10 inhibits UVA and UVB induced collagen degrading factors such as collagenase and MMP<sup>5</sup>. Green Tea Extract has clinically demonstrated anti-collagenase properties<sup>6</sup>. In general, antioxidant effects are thought to inhibit the expression of collagen degrading compounds<sup>7</sup>. Vitamin C, CoQ10, L-Glutathione, Acai Berry Extract (Vitamin E), Green Tea Extract, Pearl Coix Extract (Vitamin B2)<sup>16</sup> and Glucosamine are all potent antioxidants<sup>16</sup>.

### Glycosaminoglycan Support

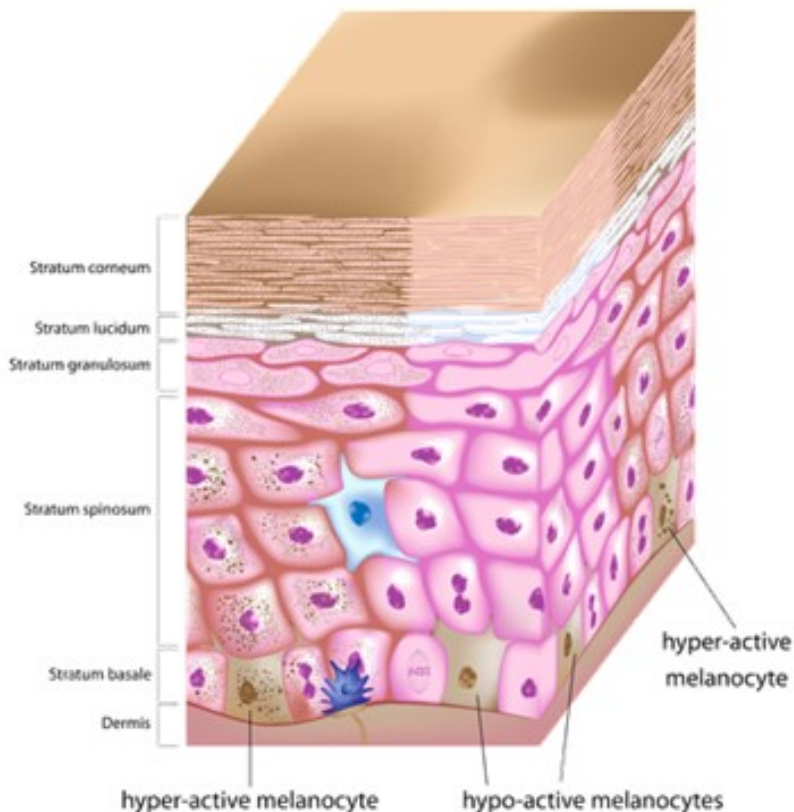
Relumins Premium Collagen Blend contains Hyaluronic Acid, a glycosaminoglycan that is a major component of the skin support structure. Glycosaminoglycans are the moisture factors in the dermis of the skin. Hyaluronic acid is both lubricating and shock absorbing with an incredible water holding capacity. This

moisture retention keeps skin smooth and plump.

Similar to collagen, Hyaluronic Acid decreases with age. And much like collagen, it can be orally supplemented. When clinically tested, oral ingestion of Hyaluronic Acid increased skin moisture content and smoothness and reduced wrinkles<sup>8</sup>.

An additional glycosaminoglycan benefit comes from the glucosamine found in the formula. A study done by the Journal of Clinical Dermatology found that Glucosamine promotes the production of glycosaminoglycans such as hyaluronic acid, accelerates wound healing, improves skin hydration, and decreases wrinkles<sup>9</sup>.

### Uneven Skin Tone



*Inflammation can damage melanocytes causing abnormal function*

## Photoprotective Properties

UV radiation is known to be one of the most damaging stressors on skin. Exposure to too much sunlight causes an influx of MMPs and neutrophils containing proteolytic enzymes into the dermis. These enzymes destroy collagen and elastin and age skin<sup>10</sup>. CoQ10<sup>5</sup>, Vitamin C<sup>4</sup>, and Vitamin E<sup>15</sup> have all been demonstrated to counteract these effects.

UV can also damage skin by increasing oxidative stress. Sun damage leads to the formation of peroxides and free radicals which can break apart DNA and rapidly age skin. Antioxidant

ingredients will effectively reduce UV induced reactive oxygen species in the skin. The Glutathione, CoQ10, Vitamin C, Vitamin E and Green Tea Extract found in this formula are all potent antioxidants.

## Antioxidants for Anti-Inflammation

Postinflammatory hyperpigmentation is a common issue faced by darker skinned individuals<sup>12</sup> in which inflammatory injury can cause skin discoloration like dark spots or patches. Even acne or a sunburn can leave long lasting dark marks. Preventing inflammation from occurring in the first place can minimize discoloration from

injuries<sup>13</sup>. Relumins Premium Collagen Blend is loaded with antioxidant ingredients which help combat the damaging effects of inflammation.

## Ultimate Drinkability

Relumins Collagen Blend is the best tasting collagen drink available today. This premium grade collagen is tasteless and odorless without the bad taste that comes with other collagen drinks. We mix our collagen with natural fruit juice to create a delicious vanilla, pineapple & blueberry flavor drink. Its low molecular weight and high purity cause it to rapidly dissolve in water. Just pour a sachet into a glass of water and enjoy!







**Available in Blueberry, Pineapple and Vanilla**

1. Oesser, S; Adam, M; Babel, W; Seifert, J. Oral Administration of <sup>14</sup>C Labeled Gelatin Hydrolysate Leads to an Accumulation of Radioactivity in Cartilage of Mice (C57/BL). *J. Nutr.* 129: 1891–1895, 1999.
2. Ohara, H; Matsumoto, H; Ito, K; Iwai, K; Sato, K. Comparison of Quantity and Structures of Hydroxyproline-Containing Peptides in Human Blood after Oral Ingestion of Gelatin Hydrolysates from Different Sources. *J. Agric. Food Chem.* 2007, 55, 1532-1535
3. Telang, P.S. Vitamin C in Dermatology. *Indian Dermatol Online J.* 2013 Apr-Jun; 4(2): 143–146. doi: 10.4103/2229-5178.110593.
4. Hantke, B; Lahmann, C; Venzke, K; Fischer, T; Kocourek, A; Windsor, LJ; Bergemann, J; Stäb, F; Tschesche, H. Influence of flavonoids and vitamins on the MMP- and TIMP-expression of human dermal fibroblasts after UVA irradiation. *Photochem Photobiol Sci.* 2002 Oct;1 (10):826-33.
5. Inui, M; Ooe, M; Fujii, K; Matsunaka, H; Yoshida, M; Ichihashi, M. Mechanisms of inhibitory effects of CoQ10 on UVB-induced wrinkle formation in vitro and in vivo. *BioFactors* 32 (2008) 237–243.
6. Thring, TS; Hili, P; Naughton, DP. Anti-collagenase, anti-elastase and anti-oxidant activities of extracts from 21 plants. *BMC Complement Altern Med.* 2009 Aug 4;9:27. doi: 10.1186/1472-6882-9-27.
7. Baumann, L; How to Prevent Photoaging?. *Journal of Investigative Dermatology* (2005) 125, xii–xiii; doi:10.1111/j.0022-202X.2005.23810.x.
8. Sato, T; Sakamoto, W; Odanaka, W; Kazuya, Y; Urishibata, O. Clinical effects of dietary hyaluronic acid on dry, rough skin. *Aesthetic Dermatology.* Vol 12: 109-120. 2002.
9. Bissett, DL. Glucosamine: an ingredient with skin and other benefits. *J Cosmet Dermatol.* 2006 Dec;5(4):309-15.
10. Rijken, F.; Bruijnzeel, P.L. The Pathogenesis Of Photoaging: The Role Of Neutrophils And Neutrophil-derived Enzymes. *J Investig Dermatol Symp Proc.* 2009 Aug;14 (1):67-72. Doi: 10.1038/Jidsymp.2009.15.
11. Vaid, M.; Katiyar, S.K.; Molecular Mechanisms Of Inhibition Of Photocarcinogenesis By Silymarin, A Phytochemical From Milk Thistle (*Silybum Marianum* L. Gaertn.) (Review). *International Journal Of Oncology* 36: 1053-1060, 2010.
12. Davis, E.C.; Callender, V.D. Postinflammatory Hyperpigmentation A Review Of The Epidemiology, Clinical Features, And Treatment Options In Skin Of Color. *J Clin Aesthet Dermatol.* 2010 Jul; 3(7): 20–3.
13. Takiwaki, H.; Shirai, S.; Kohno, H; Soh, H.; Arase, S. The Degrees Of Uvb-induced Erythema And Pigmentation Correlate Linearly And Are Reduced In A Parallel Manner By Topical Anti-inflammatory Agents. *J Invest Dermatol.* 1994 Nov;103(5):642-6.
14. Rhodes, L.E.; Et Al. Oral Green Tea Catechin Metabolites Are Incorporated Into Human Skin And Protect Against UV Radiation-induced Cutaneous Inflammation In Association With Reduced Production Of Pro-inflammatory Eicosanoid 12-hydroxyeicosatetraenoic Acid. *British Journal Of Nutrition* (2013), 110, 891–900.
15. Parsa, F.D. Vitamin E: Facts And Fallacies. *Plast Reconstr Surg,* 81 (1988), Pp. 300–301
16. Ashoori, M.; Saedisomeolia, A. Riboflavin (Vitamin B2) And Oxidative Stress: A Review. *British Journal Of Nutrition* (2014), 111, 1985–1991
17. Chang, T. An Updated Review Of Tyrosinase Inhibitors. *Int J Mol Sci.* 2009 Jun; 10(6): 2440–2475.
18. Villarama, C.D.; H. I. Maibach. Glutathione As A Depigmenting Agent: An Overview. *International Journal Of Cosmetic Science,* 2005, 27, 147–153
19. Malathi, M; Thappa DM. Systemic Skin Whitening/ Lightening Agents: What Is The Evidence?. *Indian J Dermatol Venereol Leprol* 2013;79:842-6.
20. <https://en.wikipedia.org/wiki/Collagen>
21. Etherington, D.J. Collagen Degradation. *Annals of the Rheumatic Diseases,* 1977, 36, Suppl. p. 14
22. Sikiw, D.A.; Pagano, P.J.; Colucci, W.S. Oxidative stress regulates collagen synthesis and matrix metalloproteinase activity in cardiac fibroblasts. *American Journal of Physiology-Cell Physiology* 2001 280:1, C53-C60
23. Carillo, A. Why Does Your Skin Age? <http://dujs.dartmouth.edu/2013/01/why-does-your-skin-age/>
24. Midori TANAKA, Yoh-ichi KOYAMA & Yoshihiro NOMURA (2014) Effects of Collagen Peptide Ingestion on UV-B-Induced Skin Damage, *Bioscience, Biotechnology, and Biochemistry,* 73:4, 930-932, DOI: 10.1271/bbb.80649
25. Zague, V. *Arch Dermatol Res* (2008) 300: 479. <https://doi.org/10.1007/s00403-008-0888-4>
26. Brinckmann, J., Notbohm, H. and Müller, P.K. (2005) *Collagen, Topics in Current Chemistry* 247, Springer, Berlin. )
27. <http://aibolita.com/sundries/20794-histological-and-ultrastructural-features-of-skindamage-relationship-to-altered-appearance.html>
28. Ganceviciene R, Liakou AI, Theodoridis A, Makrantonaki E, Zouboulis CC. Skin anti-aging strategies. *Dermatoendocrinology.* 2012;4(3):308-319. doi:10.4161/derm.22804.
29. Murad S, Tajima S, Johnson GR, Sivarajah S, Pinnell SR. Collagen synthesis in cultured human skin fibroblasts: effect of ascorbic acid and its analogs. *J Invest Dermatol.* 1983 Aug;81(2):158-62.