

HealthyLIFESPAN program out-line, show No. 3 March 6, 2004

Series Recap

Our genes are variable not fixed

We are *not predetermined* to have the *same poor health* of our parents. Or, conversely, not the same *good level of health* of our parents either.

It all depends on two things: what health *strengths and weaknesses we inherit* from our parents and what kind of *environment* are we exposing our genes to that will affect their expression or performance.

Modifiable Factors of Unhealthy Aging

1. Aging related to altered mitochondrial function and oxidative stress (or, *Poor Cellular Energy Production* and *Free radical damage*)
2. Aging disorders as a consequence of increased protein glycation
3. Unhealthy aging as a consequence of chronic inflammation
4. Contributions of defects in methylation to the aging process
5. Compromised detoxification ability and the risk of disease
6. Altered immunity related to aging

Protein Glycation

The body is made mostly of Proteins. The health of these proteins is a very important factor in having a HealthyLIFESPAN.

A. Protein:

- a. gives the body form and functionality.
- b. gives the body elasticity and pliability
- c. keeps us healthy looking and youthful feeling.

Proteins can become *damaged prematurely* and start to effect the function of the cells, tissues and organs of the person. When this process reaches a critical mass, it rears its head as one of the premature disorders of aging. This damaging process is called *glycation*.

Glycation is a process by which *sugar* in the blood or tissues of the body *become combined with proteins* to produce the damaging glycated proteins. These are proteins whose structure and function become altered and effect ones health in a number of ways.

Illustration: Glycation is a process much like the browning reaction of baking that produces the crust on the bread.

It's important to know because when proteins become increasingly damaged if we live unhealthy lives and increase the aging of our arteries, brain, skin, & eyes.

Diabetes

All *proteins* in the body are *glycated during* conditions of *poor control of insulin and glucose metabolism*. The poorer the glucose control, the greater the binding, leading to even greater protein damage.

Type I Diabetes (adult onset diabetes) – relatively rare before the 20th century has led experts to classify it as a *disease of modern living*. Diabetes speeds up aging through the process of protein glycation.

- A. 17 million Americans with diabetes
- B. 16 million with various stages of prediabetes – insulin resistance or glucose intolerance.
- C. Approx. 1/3 of 17 million diabetics are unaware that they have it.

Protein glycation caused by *poor control of insulin and glucose metabolism*, found in diabetes and stages of prediabetes, results in the formation of AGEs (advanced glycosylated end products.) AGEs:

- A. Are accumulations of glycated or “Crusty” proteins that clump together.
- B. AGE’s accumulated in the bloodstream results in the activation of receptors for AGEs (RAGEs) on cellular membranes, causing mitochondrial damage and inflammation.
- C. AGEs accumulation results in:
 - a. Periodontal disease & loss of teeth in adults
 - b. Skin aging and accelerated wrinkling
 - c. Increased risk for heart disease.
 - i. *HealthyLIFESPAN Factoid: When glucose binds to LDL carrying molecules, it blocks the LDL from binding to receptors on the liver that signals the liver to stop manufacturing cholesterol. Diabetics almost always have high cholesterol.*
 - d. Alzheimer’s disease

Protein glycation and the *formation of AGE’s* can be *modified through dietary and lifestyle improvements*.

- A. Diet high in *unrefined complex carbohydrates* and *fiber*
- B. Adequate *protein* intake
- C. *Essential Fatty Acids* – Omega 3’s, Omega 6’s, Fish & GLA oils (for proper insulin control.)
- D. *Dietary supplements*: Magnesium, Vitamin E, Chromium, & Vanadium. (for proper insulin control.)
- E. *Carnosine* – Nature’s pluripotent life extension agent that fights protein glycation.

Carnosine

- A. Carnosine is a natural short chain protein (dipeptide) made up of amino acids Alanine & Histidine.
- B. Naturally present in the body and in food.
- C. High levels found in the long lived cells of the nervous system and muscle cells.
- D. Muscle levels of carnosine correlate with the maximum lifespans of animal species.
- E. *Why is it considered a pluripotent life extension agent?* Because Carnosine is active in a multitude of ways and in many tissues and organs according to published studies. Carnosine addresses the “**Paradox of Life**”: elements that make life possible – oxygen, glucose, lipids, protein, trace minerals – also destroy life in ways that are protected by Carnosine.
- F. Carnosine:
 - a. Is one of the most potent and effective *anti-oxidants*
 - b. Most potent and only *natural anti-glycation agent*
 - c. *Aldehyde quenching*
 - d. *Metal chelating* actions
- G. Studies show effective against glycation causing accelerating skin aging, cataracts, and neurodegeneration.

Carnosine and AGE formation

Carnosine is by far the *safest* and *most effective* anti-glycating agent.

- A. Carnosine *blocks glycation and AGE formation* in a wide variety of experimental models.
- B. Sacrifices itself to become glycated in place of its healthy protein neighbors(Non-toxic.)
- C. Protects healthy proteins around existing AGEs (damaging proteins.)
- D. Helps the body dispose of AGEs (damaged and unneeded proteins.)

Carnosine & Brain Aging

- A. High amounts in brain protect against excitotoxicity, copper and zinc toxicity, protein glycation, & oxidative damage to neuronal cell membranes.
- B. Carnosine *blocks the glycation of ameloïd-beta protein* which leads to plaque formation in the brains of Alzheimer’s victims.
- C. *Helps Alzheimer’s* patients by *improving circulation* to the brain by:
 - a. Protecting cells that line the brain blood vessels from ameloïd-beta (senile plaque material)
 - b. Toxic by products of lipid oxidation
 - c. Alcohol metabolism
- D. *Lowers levels of MDA*, a toxic by product of membrane lipid oxidation
- E. *Lowers MOA-B activity*, protecting brain dopamine metabolism.
- F. *Reduced excitotoxic effects of glutamate* (main excitatory neurotransmitter) by increasing it’s binding efficiency. Thus, protecting brain cells from excitotoxic death.

- G. Carnosine enhances longevity of brain cells.
- H. **Antioxidant: oxidation of lipids** in brain cell membranes generates highly toxic byproducts such as *HNE* and *other aldehydes* which are *quenched by carnosine*.
- I. Metabolism copper and zinc in the brain needs to be buffered to protect against toxicity. If not, leads to plaque formation associated with Alzheimer's disease. Carnosine also protects brain cells from toxic effects of these minerals by chelating them. Amazingly, Carnosine then uses them to become a more potent antioxidant.
- J. To attain these benefits from Carnosine, take orally 500mg cap twice a day as a dietary supplement.

Carnosine & Skin Health

Glycation plays a significant role in the accelerated aging of the skin.

- A. Epidermis (outer skin layer) changes only subtly with age, extreme changes occur in the dermis (inner skin layer) leading to loss elasticity and wrinkles.
 - a. Dermis connective tissue cells are cut in half by 80 years old.
 - b. Collagen, connective tissue cells become disorganized, broken down and the skin shows signs of widespread destruction.
- B. Carnosine formula available in a topical serum that melts away wrinkles by blocking glycation and restoring collagen in the skin.

Carnosine & Eye Health

- A. **Retinopathy** – serious eye disease involving the retina (the collection of light sensitive cells lining the back of the eye.)
 - a. Diabetic Retinopathy – Leading cause of blindness in U.S. for people between ages of 20 and 64.
 - b. Damage to cells of the retina by: microhemorrhages, scarring, and protein glycation (attachment of glucose molecules to structural proteins in the retina.)
 - c. Studies show: after 20 years of diagnosis with diabetes, 80 % of type 1 and 20 % of type 2 diabetics have significant retinopathy.
- B. **Cataracts** - Diabetics are prone to have cataracts (opaque or non-transparent area that occurs on the lens of the eye due to glycation - damage to the delicate protein structures of the lens caused by sugars.)
- C. **Solution: Carnosine eye drops** (LEF Product called: **Bright Eyes II**). One study showed them to be effective in 100% of cases of primary senile cataract and 80% of cases of mature senile cataract.

Conclusion

Supercharge your HealthyLIFESPAN program with Carnosine in three convenient forms:

- 1) **500mg capsules:** taken orally twice a day to protect your Brain and cardiovascular system
- 2) **Topically on Skin:** Serum applies topically to facial areas and lotion for rest of the body.
- 3) **Eye Drops:** Bright Eyes II, one drop in each eye daily.

All of these wonderful supplements are available at Life Extension Nutrition Center in the highest quality and potencies in the world.

Call us at 407.599.9600 or e-mail us at info@healthyLIFESPAN.COM for a free article reprint from Life Extension Magazine on Carnosine for later review at your convenience.