

ARK[®]
AGE AWARE SKINCARE

Fact Sheet: What Happens to Your Skin as You Age?

Skin Ageing

The skin is at the mercy of two threatening environments, the outside world and our inner health. They both impact the integrity of our skin, its response to injury, its appearance and the speed with which it ages. The influence of the two environments is of equal importance, and both need to be addressed if we are to be successful in our skin therapy.

Let us look at the important factors associated with skin ageing and determine the influence of each environment.

Cells and Proteins

The skin demonstrates a very rapid turnover with new cells being continually produced in the deepest layer of the epidermis (germinativum), migrating toward the surface, maturing and dying. The rate at which our body replaces lost and damaged skin cells decreases as we age. In fact, it drops by 50% between the ages of 28 and 80 years of age.

As I have already described, the dermis consists of a gel-like ground substance made up of large molecules (glycoproteins, GAGs) and water. Running through this are strong reinforcing collagen fibres (98%), which provide strength, and elastin fibres (2%), which provide elasticity. Fibroblast cells within the dermis are responsible for manufacturing collagen and elastin. Unfortunately, they stop making elastin soon after puberty, and we are left then with a finite amount, one of the factors associated with loss of skin elasticity during ageing. In addition, the amount and quality of collagen formed deteriorates over time.

The formation and repair of collagen is one of the keys to skin health. Collagen has been likened to a “biological rope”. It is composed of smaller subunits called tropocollagen, molecules containing the 3 amino acids, glycine, proline and lysine. Together with the GAGs and water comprising the ground substance matrix, they form a strong foundation for the skin, holding water within the structure to maintain strength, flexibility and turgor. As we age, collagen formation decreases, as does GAG concentration, resulting in loss of hydration, integrity and subsequently reduced skin “tone”.

Factors associated with skin ageing:

- Reduced cell production and turnover – less regeneration
- Reduced collagen formation – lower strength
- Loss of GAGs and water – less turgor
- Deterioration of limited elastin fibres – less elasticity
- Reduced immunity

These factors contribute to the changes we see in the skin as it ages; changes such as reduced tone, wrinkles, thinning and reduced flexibility.

In addition to these intrinsic factors, there are other important influences from our external and internal environment that adversely affect skin ageing, augmenting the inherent degradation of skin quality.

Oxidation

Oxidation is a chemical reaction central to the ageing process. Reactive Oxygen Species (ROS) are atoms or small molecules including peroxides and free radicals that have an unpaired electron. They are subsequently highly reactive and can combine with enzymes, proteins and DNA causing damage and malfunction. In excess they promote inflammation causing immunogenic damage.

External Factors increasing Oxidation:

- Ultraviolet light
- Environmental Pollutants e.g. smoke, fumes
- Ionizing Radiation e.g. x-rays, radiography
- Heat

Internal Factors increasing Oxidation

- Dehydration
- Infection
- Stress
- Inflammation

Cells have the ability to defend themselves against ROS through enzymes and molecules including Vitamin C, the antioxidants. One of the important enzymes is superoxide dismutase (SOD), which breaks down inflammatory free radicals into stable components. In addition, SOD lowers the production of inflammatory cytokines (immune system proteins) such as IL-10, and helps regenerate “used” antioxidants in the body. SOD also protects both fat and water-soluble tissue, DNA, mitochondria (cell ‘power houses’) and collagen from inflammation. Production and function of SOD decreases with age resulting in inflamed weakened and wrinkled skin.

As our external and internal environments provide an ever-increasing free radical load and our cells lose their ability to fight, protecting the skin with both external and internal antioxidants becomes an important factor in age defence.

When we were developing the ARK Age Aware Skincare range, it was very important for us that we provided protection and antioxidant therapy from both the outside and the inside.

Examples:

Skincare Products

The **age prepare** skin vitality moisturiser contains Anti-Pollution Algae, derived from algae living in hostile environments that quenches free

radicals and provides a natural barrier to environmental pollutants.

The [age maintain](#) replenishing moisturiser contains Shea Butter containing a natural SPF and powerful antioxidant properties.

The [age repair](#) supporting moisturiser contains Vitamin C which neutralizes damaging UV induced free radicals that breakdown collagen and mutate the DNA of cells.

Supplements

The ARK Ultra Antioxidant supplement contains Vitamins A, C, E, bioflavonoids and more to greatly reduce internal oxidation and inflammation.

Glycation

Glycation (also called non-enzymatic glycosylation) is a process in which a sugar molecule, such as fructose or glucose, binds to a protein or lipid molecule or fragment of DNA without the assistance of an enzyme. The products formed are called AGEs or Advanced Glycation End products, molecules that can be highly reactive and disruptive to normal biomolecular function.

AGE's are the universal molecule of ageing and one of the leading causes of deterioration in many organs including the skin. AGEs greatly increase inflammation in the skin, multiplying the rate of free radical production 50-fold. In addition, they form cross-links to adjacent proteins that result in reduced tissue flexibility with stiffness and breakage of the supporting collagen fibres. Finally, AGEs increase the production of inflammatory cytokines within the immune system, further accelerating the process. This combination of effects weakens the skin causing sagging, puffiness and wrinkle formation.

AGEs are also associated with the following diseases:

- Diabetes
- Cardiovascular disease
- Alzheimer's
- Cancer
- Neuropathy

AGEs come from two sources:

Exogenous: Ingested AGE's occur in foods prepared with high temperature cooking combining sugars and protein or fats. AGEs are also added by manufacturers to improve taste and colour particularly in browned or caramelised foods.

Endogenous: Fructose, galactose and, to a lesser extent, glucose can be converted in the body by a series of reactions to AGEs. Once formed,

these AGEs are poorly eliminated and survive in blood and tissue longer than many cells do. Their effects are therefore prolonged and this explains their impact on ageing and disease.

Our aim with the ARK Age Aware Skincare range was to provide protection against glycation and inflammation from both the outside and the inside.

Examples:

Skincare Products

The **age prepare** skin purifying masque contains a Multivitamin complex including Vitamins C and F. Vitamin C supports the formation of lipids in the skin's barrier and regulates collagen synthesis, and Vitamin F promotes the cellular regeneration of membranes and tissues, thus preventing abnormalities.

The **age maintain** replenishing moisturizer contains Anti-ageing Peptides that prevent sugars from attacking collagen and other proteins in the skin that initiate the damaging glycation process.

The **age repair** nurturing masque contains Blackcurrant & Starflower Lipids, active Omega 3 and Omega 6 fatty acids that mimic the natural fatty acid layers of the skin and deteriorate with age. These fats have been shown to moisturize, rebuild and protect skin cells from oxidation, glycation and environmental damage, ultimately slowing down the ageing process.

Supplements

The ARK Collagen Forte supplement contains amino acids that help regulate growth, hormone control and balance blood sugars. When it comes to diet, increasing protein at each meal greatly stabilises blood sugars and decreases glycation.

Altered Immunity

As we age, our immune system weakens, impairing our reaction to injury or infection. There is a decrease in the immune system's ability to recognise foreign bodies, whether they are relatively benign agents such as organic particles or more damaging substances like bacteria and pollutants. If these foreign materials are not noticed and neutralised right away, they can exert a prolonged effect on the body. They can bind into the cells of various tissues, increasing free radical inflammation and causing damage or, if they are infective in nature, they can replicate and spread.

The skin is no exception to this age-related decline with important immune components such as Langerhans cells and macrophages diminishing in number and potency. This allows potentially harmful environmental factors to damage the skin unhindered. This, in association with inadequate repair mechanisms, significantly contributes to the ageing process.

Once the foreign body or invading substance (called an “antigen”) enters the skin, it is ingested by the Langerhans cells which act as a gatekeeper for the immune reaction. They present foreign material to the cells of the immune system in a way that allows rapid mobilization of neutralising forces such as antibodies. Once the antibodies react with the antigen, other cellular and chemical reactions of the immune process allow its destruction and removal.

The ageing skin demonstrates both inadequate and dysfunctional immunity. Reduced numbers of cells (such as Langerhans cells), impaired or weakened antibody production and poor cellular response all contribute to a less effective defence mechanism. In addition, inappropriate triggering of the immune reaction can lead to hypersensitivity with redness and rash formation.

ARK Age Aware Skincare counteracts the effects of ageing and supports the immune function of your skin by:

- Improving skin integrity and thus its mechanical barrier function
- Providing antioxidant support
- Providing anti-bacterial activity

Examples:

Skincare Products

The **age prepare** skin refining exfoliator contains **Margosa Leaf extract** which is antiseptic and antibacterial.

The **age maintain** renewing exfoliator contains **Blue Lotus extract**, rich in flavonoids in particular rutin, quercetin, and phytosterols which give it anti-oxidant, anti-inflammatory and antibacterial properties.

The **age repair** supporting moisturizer contains **Beta Glucans and Chitin** whose polysaccharides regulate TNF, IL's and NK cells, the main anti-viral, anti-bacterial and anti-cancer cells of the immune system

Supplements

The Ark Nutra-Derm supplements contains This formula provides all the essential vitamins and minerals to support healthy skin growth and maintenance. It contains vitamins A, B1, B2, B6, B12, Pantothenic acid, folic

B vitamins are essential components in most metabolic reactions ranging from the breakdown of food into energy, to the production of hormones, maintenance of the nervous system and growth of new skin cells. Zinc is an important co-factor in all reactions needed for cellular turnover . PABA has powerful anti-oxidant properties, while inositol and choline help regulate the nervous system and inflammatory processes.

Hormones and Enzymes

Growth hormone, produced by the pituitary gland, is essential for the processes of growth and repair throughout the body. Its production decreases as we age, resulting in impaired cell replication and collagen manufacture within the skin. In addition, lower growth hormone levels promote inflammation, resulting in greater free radical damage.

Oestrogen receptors are located in the skin, and research demonstrates that oestrogen increases the activity of skin fibroblasts. As oestrogen levels decrease with age, the process of cell renewal slows and the skin thins while losing elasticity, causing wrinkles to deepen complexion to dull. Some estimates show that the skin loses up to 30% of its collagen fibres in the first five years after menopause, and without intervention, post-menopausal skin will continue to degenerate. Clinical data shows that women taking oestrogen and progesterone have skin that is 48% thicker than women with no hormonal support. In addition these women also show increased skin sebum production and skin hydration with resulting decreased wrinkle depth. Finally, oestrogen can increase cutaneous wound healing by helping to regulate cytokines.

Examples:

Skincare Products

The **age prepare** skin vitality moisturiser contains **Creatine**, a natural amino acid derivative that has been shown to play an important role in activating the enzymes that revitalize cellular metabolism, as well as supporting and protecting skin from environmental damage.

The **age maintain** replenishing moisturiser contains an **Anti-ageing Peptide** that stimulates the skin increased fibroblastic activity in order to reconstitute the extracellular matrix and strengthen all structural components of the skin cell. It also contains Co Enzyme Q 10, a nutritive that activates several enzymatic pathways involved in oxygenation of all body tissues.

The **age repair** supporting moisturiser contains **Red Clover extract**, well-known for its high content of isoflavones or phytohormones. Phytohormones are said to have oestrogen-like effects which support anti-ageing activities in mature skin types, all the while decreasing the risk of estrogen receptored cancers.

Supplements

The Ark Amino Acid Complex supplement which is recommended to take with **age maintain** products, contains three amino acids, glycine, proline and lysine which are necessary for the manufacture of collagen. Lysine and arginine are the two amino acids required for the synthesis of growth hormone which will, in turn, improve fibroblast activity and skin repair. Also Soy Isoflavones provide safe oestrogenic support.