Skin ageing

It is well know that skin ageing is largely due to free radical activity that takes place in the epidermis (upper layer) of the skin. In a study published in Biochemistry and Molecular Biology International, scientists topically applied alpha-glycolic acid, vitamin E and/or melatonin to monitor the anti-ageing effects in the different skin layers. Each of these natural substances showed some benefit when applied separately, but when applied together, the melatonin, vitamin E and alpha-glycolic acid become dynamic boosters of each other. Indeed, the antioxidant activity of vitamin E enhanced the epidermal turnover effect of glycolic acid, while glycolic intensified the effect of melatonin. Previous studies have shown that melatonin and vitamin E are potent free radical scavengers and highly protective agents against UV skin damage and skin ageing. The results of this study showed a synergistic benefit when melatonin, vitamin E and alpha-glycolic acid where topically applied to the skin. A drawback to using Retin-A and alpha hydroxy acids is skin irritation and inflammation that sometimes manifest as red blotches. A study in the Journal of Pharmacology and Biophysical Research showed that Ginkgo Biloba extract signals fibroblast activity in the skin to increase the synthesis of collagen, while serving as an anti-inflammatory agent. Professor Carmen Fusco has found that the topical application of gingko extract dramatically reduces the irritation that some people experience when using products like Renova, Retin-A and fruit acid compounds. In the journal Skin and Allergy News, a study was published on women who applied a cream that contained antioxidants and a sunscreen to their skin for 18-months. These women were compared to a placebo group who applied a sunscreen that did not contain antioxidants. The results showed that compared to placebo, the women using the sunscreen plus antioxidant cream:

- Manifested fewer lines and wrinkles
- Showed reduced lipid peroxidation to the skin
- Had greater skin thickness and elasticity The study showed how solar radiation and environmental pollutants produce adverse effects to the skin by causing oxidation, and how topically applied antioxidants confers protection when used with a sunscreen. This study also showed that topically applied antioxidants protected the skin better than orally ingested antioxidant supplements. Rejuvenating aged skin: the pioneering work of Benjamin S. Frank, M.D. showed that RNA improved cellular energy and the ability of the skins cells to use oxygen. This improved metabolism enhances the movement of young cells to the surface of the skin where they replace old cells. Another benefit from topically-applied RNA is to repair early skin cell damage. Clinical trials by Dr. S. J. Jellinek in the 1970's demonstrated how creams containing RNA/DNA caused a visible lifting/ tightening of the skin, and the wrinkles appeared to be less visible in a three week period. Although the study was a small scale study, it was nonetheless a double blind test. Alpha glycolic acid is the most potent of the alpha-hydroxy acids that have been shown to erase fine wrinkles in ageing human skin. The mechanism of action of alpha-glycolic acid is to break down old cells at the skin surface so they can be replaced with more youthful cells underneath. A 22-week, double blind, randomized clinical trial at Massachusetts General Hospital in 74 women over age 40 showed that topically applied alpha-glycolic acid significantly reduced wrinkling and other types of damage caused by chronic sun exposure. Molecular moisturisers: Replacing moisture lost to ageing is the primary reason women use body lotions. Drs. Stig Fribergand and David W Osborne showed that this glycerid acid inhibits trans epidermal water loss by preventing the lipids (fats) from crystallizing. This mechanism is central to preventing dry, thin, leathery, dull, wrinkled skin. This particular glycerid acid also seems to increase the effectiveness of sunscreens and enhance the receptiveness of skin cells to antioxidants such as vitamins A, C and E.

Hyaluronic acid helps the skin retain its youthful moisture via a different mechanism than glycerid acid. Hyaluronic acid maintains the integrity of the connective tissue because it is a source of manganese and glucosamine. Protecting against damaging free radicals: Vitamins A, C and E serve as antioxidants and enhance epidermal turnover and collagen synthesis. Numerous studies substantiate that when topically applied, these vitamins provide broad-spectrum protection against pre-mature skin ageing. Augmenting the reservoir of antioxidants in your skin on a daily basis is the best assurance of continuous protection against the damaging effects of oxygen, UV light and environmental pollutants. Vitamin C does more than quench skin-damaging free radicals. It is also required for collagen synthesis, which declines markedly in ageing skin. As we grow older, we suffer diminished micro capillary circulation within our skin, which deprives our skin cells of the supply of vitamin C it needs for youthful collagen synthesis. The topical application of vitamin C in a skin penetrating medium can dramatically enhance the availability of vitamin C for collagen production. Furthermore, vitamin C regenerates vitamin E in the skin. An antioxidant such vitamin E can only suppress a limited number of free radicals before it runs out of electrons to donate. Vitamin C regenerates vitamin E and enables vitamin E to provide sustained antioxidant protection in the skin's elastin fibers. A study in the Journal of Investigative Dermatology showed that the direct application of vitamin C, a vitamin E analog, or selenium significantly protected mouse skin cells in tissue culture from damage caused by exposure to UVB light. A study in the journal Revista Espanola de Fisiologia demonstrated how the direct application of vitamin C provided significant protection against the senescence of human skin cells in tissue culture. A study in the British Journal of Dermatology revealed that UV irradiation "severely depleted" skin level of vitamin C in pigs, and that the topical application of vitamin C significantly elevated vitamin C levels in the skin of these animals. Vitamin C plays a vital role in skin repair. When skin is injured, its vitamin C content is used up rapidly in the scavenging of free radicals, and in synthesizing collagen to speed healing. The antioxidant hormone: Melatonin is a hormonal antioxidant that protects the skin against oxidative damage. A research group at the University of Zurich has shown that topical melatonin gives excellent protection against sunburn if applied before sun exposure. Melatonin also appears to have a role in repairing

burned skin. In a study published in Britain Research Bulletin, melatonin levels rose six hours after burn injury, and then fell to normal. In small amounts, melatonin causes skin cells to proliferate. Applied topically, it appears to have greater anti-ageing properties to the skin than does DHEA. Melatonin protects against the most damaging oxidizing agent known as the hydroxyl radical. Studies show that topical melatonin, when used in a cream, protects the skin from UV-induced skin damage and skin ageing. Research from the Department of Dermatology at the University of Zurich, in Switzerland, not only demonstrated the role of free radicals as a cause of acute and chronic skin damage, but also the efficacy of melatonin as a potent free radical scavenger. Protecting the skin against free radical injury is a crucial step in preventing skin ageing. The skin, by its very location and nature, is most vulnerable to free radical damage from environmental chemicals, mechanical injury and UV radiation. Skin free radicals are also influenced by internal oxidative mechanisms. Melatonin, in combination with vitamin E and alpha-glycolic acid, may be the most effective way to protect against the oxidative damage and restore more youthful cells to the skin's surface.