A Multi-Functional Botanical Active based on Ginkgo for Anti-Aging

Authors: Dr Jane Tiedtke & Dr Olaf Marks – Cosmetochem International Ltd., Switzerland

Abstract

When choosing an anti-ageing active for use in skin care products there is a long list of desirable properties such as antioxidant, free radical scavenger, stimulant of cell regeneration and collagen production to name but a few. This paper describes a concentrated botanical extract derived from Ginkgo biloba leaves*, which has the advantage of being multi-functional and with independent laboratory data to support claims that it is both an effective stimulant of cell regeneration and an active free radical scavenger. In the literature Ginkgo biloba is also cited as having antioxidant, anti-inflammatory and circulatory stimulant properties and to inhibit elastases and hyaluronidases associated with ageing. It is specially developed for use in skincare in particular anti-ageing and sun care products.

1. Introduction

1a. Free radicals

Free radicals are a reactive oxygen species which can cause severe damage to biologically active molecules in cells[1,6,33]. They are unstable molecules that are seeking an electron. By removing electrons from evenly paired molecules they create more free radicals resulting in a chain reaction which eventually leads to massive degenerative changes in the cellular DNA and the immune system. These changes can result in damaged lipid membranes, an accelerated ageing process, damaged or altered DNA and a compromised immune system.

Below are examples of different free radicals :

- Superoxide Anion radical: O_2- : originates especially from enzymatic reactions.
- Hydroxyl radical: OH^- : Mainly formed under irradiation. (X - rays, UV - rays, ϒ - rays)
- O_2 molecular oxygen: (although this is no radical it acts often like a free radical). Mainly originating from photochemical activation of oxygen.
- Peroxy radicals: ROO: appear essentially with oxidation of polyunsaturated fatty acids.
- Polysaturated fatty acid radical

Free radicals can be caused by a number of different phenomena:

- Tobacco smoke
- Pollution
- Pesticides & herbicides
- Infection /disease
- UV radiation
- Alcohol
- Carcinogens
- Physical & emotional trauma

1b. Antioxidants & free radical scavengers

Free radicals can be neutralized by substances that are called antioxidants or free radical scavengers. They accomplish this by donating a free electron to the free radical which then stabilizes the molecule and prevents it doing further damage. Examples of some antioxidants are vitamins C, E & A and flavonoids.

Flavonoids

Flavonoids are polyphenolic compounds that are found in plants and which have well known antioxidant properties[1,2,3,5]. The flavonoids include phytochemical groups such as catechins, flavonols, flavones, flavanes and anthocyanidins and these different classes of flavonoids vary in their potential oxidative ability. The free radical scavenging activity of flavonoids is related to their molecular structure and the pattern of substitution on the hydroxyl groups[1,53]. The ability to scavenge free radicals plays an important part in the effectiveness of flavonoids as antioxidants[1] and many have antioxidant capacities that are higher than vitamins C & E[52]. Many plants that are high in certain flavonoids have been used medically to counteract the adverse effects of disease in which free radicals are implemented[1,51]. The intake of food high in anti-oxidants has been recommended also to ensure a healthy diet[1,14].

What role do free oxygen radicals play in skin ageing?

Skin care cosmetics and in particular anti-ageing and sun care products are developed to counteract and prevent the adverse effects that free radicals have on the skin. These adverse effects may include premature ageing, inflammation or even in the