



Introduction to Snail Extract

Introduction

The Snail Extract was discovered by a Spanish clinical oncologist, Dr. Iglesias, in the late sixties. Dr. Iglesias research focused on finding a new substance to be used in the treatment of cancer patients of radiation induced dermatitis and burns. Snails are one of the oldest species around the globe and have survived extreme environmental conditions for more than 600 millions years. This fact indicated there was something special about the snail constitution that allowed their species to endure for so long.

Dr. Iglesias' research consisted of exposing a specific species of snail to ionizing radiation (X-rays and/or Gamma rays) and carefully studying its reaction. The exposure to the rays caused small lesions on the snail skin. As a defense mechanism, the snail retracted its antennas and released large amounts of a unique fluid on the affected area repairing the damage to its skin in a short period of time. This fluid is different than the one normally secreted during its locomotion.

Dr. Iglesias spent the next fifteen years developing a method to collect, stabilize and maximize the concentration of the fluid's main active ingredient and transform the fluid into an extract to be used in a topical composition. The topical composition would then be used on cancer patients. The method and its therapeutic and cosmetic compositions are registered under a US patent filed in 1994. A topical cream resulted from Dr. Iglesias

research that was later clinically tested for its efficacy. Dr. Iglesias saw his major breakthrough in 1986 after the world's worst nuclear power accident at Chernobyl in the former USSR (now Ukraine). The Chernobyl accident killed more than 30 people immediately, and left several thousands burning victims as a result from the high radiation levels in the nuclear plant surrounding a 20-mile radius. Former USSR Government personnel, in their search to find a miraculous way to treat the many burnt victims of the Chernobyl accident, came across the articles written by Dr. Iglesias in medical European magazines published years earlier.

Transition from Therapeutic to Cosmetic

An European Cosmetic company in collaboration with the renowned cancer institute, the MD Anderson Cancer Center at the University of Texas, developed an innovative line of products containing CAS® (Cryptomphalus aspersa secretion) to assist in the prevention and treatment of radiodermatitis. Cryptomphalus aspersa is the snail species used in the CAS® product line. Clinical studies showed that acute and chronic radiodermatitis patients experienced significant improvements when treated with products containing CAS®.

The results in the area of radiodermatitis prompted additional studies into how CAS® could help skin damaged by photoaging. Dr. Iglesias found in his early studies that the fluid secreted from the snail was a mixture of amino acids, proteins and natural enzymes



also found in the human skin. The chemical composition of the CAS[®] is shown in Table 1.

Table 1
Natural Factors included in CAS[®]
(Therapeutic Use)

<i>FACTOR</i>	<i>ACTION</i>
Low molecular weight protein	Fibroblast growth factor activity
High molecular weight protein	oxygen carriers (copper-haemocyanin)
Enzymes	Collagenase and gelatinase activities
Hyaluronic acid	Deep tissue hydration
Mucopolysaccharides / glycoproteins	Reconstitution of the extracellular matrix
Trace elements (Ca²⁺)	Cellular renewal

After the great success of the product line to treat radiodermatitis, the same company decided to develop a product line for the Cosmetic industry. These products were formulated using lower concentrations of the active ingredients in CAS[®]. The principle behind the CAS[®] cosmetic product line is to provide natural substances that the organism can no longer produce. CAS[®] provides these substances that act directly on the fibroblasts, the main cells involved in the recovery and regeneration of the skin.

The CAS[®] cosmetic product line has a unique triple rejuvenating mechanism that is able to increase the production of fibroblasts, facilitate the remodeling of the basal membrane with collagen, and reduce the amount of free radicals. Its main applications are to reduce the appearance of wrinkles and

expression lines while increasing skin firmness and elasticity.

The CAS[®] cosmetic product line focuses on the following areas:

- Photoaging - Reactivates natural skin regeneration, improving cell functionality
- Ablative and non-ablative rejuvenation techniques - Post-treatment care for rapid cutaneous repair (i.e.: Laser and peeling)
- Topical and oral retinoids – Repairs skin problems caused by retinoids, restoring skin integrity

Table 2
Composition of CAS[®]
(Cosmetic Use)

<i>COMPONENT</i>	<i>ACTION</i>
Protein	Enriches and softens the skin (Extract concentration of protein = 60%)
Vitamin E	Helps protect the skin against damaging free radicals
Natural Collagen and Elastin	Rejuvenates the skin
Natural Glycolic Acid	Allows skin to exfoliate, eliminating dead cells that are deposited in the skin's surface along with wrinkles and expression lines. Since the glycolic acid found in the Snail Extract is not synthetic, it is very unlikely to irritate the skin
Natural Allantoin	Allantoin is what allows the regeneration of the skin. It helps reduce the appearance of scars, stretch marks and helps in healing wounds faster; leaving almost no visible marks



How does it work

The Snail Extract has a mechanism that activates the "Langerhans cells"(macrophage cells) whose activity slows down due to the aging process and during constant sun exposure. One of the main functions of the "Langerhans cells" is to signal to the fibroblasts the need to produce proteins during the dermis regeneration phase for the defense cells that counter-attack the invasive agents. The normalization of the "Langerhans cells" activities via proteins and mucopolysaccharides from the Snail Extract would be sufficient to reactivate the functions from the neighboring cells, hence stimulating the production of fibroblasts and the growth of epidermic cells. As a consequence, the synthesis of collagen and elastin is exacerbated and the epithelization speed is normalized, thus reducing the appearance of wrinkles and bringing back the smoothness, shine, and uniformity to the aging skin.

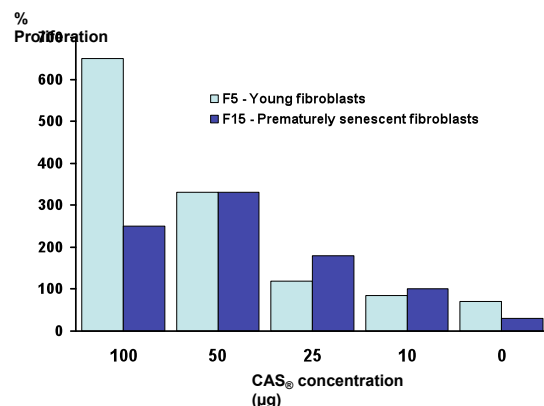
The dryness, wrinkles, loss of elasticity and irregular pigmentation that can be observed in older skin are a consequence of several structural alterations of the skin such as decreased proliferation of epidermic cells and thinning of the dermoepidermal junction. The skin's turnover suffers a 50% loss from beginning to end of life, and the fibroblasts become more proteolytic. The collagen matrix becomes disorganized and its contents tend to diminish circa 1% per year during its adult life. The elastin contents also diminish at the same rate after the thirties.

With aging, the skin reduces the production of natural substances that are essential to maintain the appearance of the skin causing

fine lines, wrinkles, uneven skin tones, etc. CAS[®] provides these substances in a natural form to assist in reversing the aging process.

The frequent exposure to the sun is also a major contributor to the skin's degeneration by reducing cutaneous vascularization (>35%) and melanocyte activities (10-20% per decade) as well as reducing the quantity of hyaluronic acid and dermatan sulphate. In addition to all the aging steps described above, the skin's immunological system also becomes weaker and reduces the synthesis of fibroblasts stimulating cytokines and keratinocytes. The result is a significant reduction of the skin's metabolism. As a consequence, wrinkles, lack of elasticity, and other aging signs begin to appear.

The following chart represents the effect of increasing doses of CAS[®] on fibroblast proliferation:



The repair enzymes also exert an important role in the cosmetic action of the Snail Extract, since it activates cutaneous functions and improves its general conditions. The enzymes smooth the skin by reducing its thickening. The polysaccharides also block free radicals and reduce the destruction of the



existing collagen fibers and elastin, favoring the dermis appearance. These substances work as moisturizers to the skin.

The active ingredients appear in their natural form and work directly into the skin repair mechanisms as follows:

- Provides fibroblast growth activity:
 - Induces fibroblast proliferation
 - Provides hyaluronic acid
 - Provides new collagen and elastic fibers
 - Provides fibronectin and other components of extracellular matrix
- Favors the correct assembly of fibronectin extracellular matrix
- Facilitates the restoration of the skin via the Triple mechanism on collagen fibers by:
 - Collagenase activity on denatured collagen
 - Providing copper-haemocyanin to supply the necessary oxygen for proper collagen formation
 - Providing a structural network of fibronectin
- Restores the elastic fiber network
- Increases the skin's natural ability to retain water, therefore, influencing the skin's volume and elasticity

Clinical Studies

Several clinical studies were conducted in Europe to evaluate and establish the efficacy of the products made with Snail Extract in the treatment of skin aging. Two of the clinical studies are summarized below:

Dr. A. Brieva and his team evaluated the **Snail extract** in its capacity to stimulate fibroblastic cells. This study was conducted in

the *Industria Farmaceutica Cantabria's* research and development department in Spain. According to researchers, the *Cryptomphalus aspersa's* secretion, under laboratory controlled aggression conditions, contributed in the adaptation of the experimental skin model. The product provided this type of protection by means of a reconstructive mechanism in the extracellular matrix, and by the stimulation of main cells in the dermic function, such as fibroblasts and lymphocytes. This work has been published in the *Dermatologia Cosmética* magazine, and it cites the biological properties of the Snail Extract when evaluated in humans and murines. The researchers denominated the secretion as "a natural adaptogen for the skin".

In a separate study, Dr. M. Tribo and his research team, evaluated products made with CAS[®] to treat wrinkles associated with skin photoaging. The study demonstrated the efficacy of applying a cosmetic formulation to facial skin in the treatment of skin degenerative processes associated with skin photoaging. The product was applied to the facial surface on a continuous base for an eight-week period to a group of 32 individuals that had visible signs of facial photoaging. The activity of the product was evaluated at 2, 4, and 8 weeks using a clinical evaluation method and the results were correlated with those seen with instrumental techniques. Also the product's tolerance and degree of cosmetic acceptance were evaluated. Dr. Tribo's research concluded that the CAS[®] based product was effective in reversing the degenerative signs of skin photoaging.



Composition and Recommended Use

The therapeutic and/or cosmetic compositions contain about 0.1-40% of the active ingredient. Both the therapeutic and the cosmetic compositions are for use in the form of topical creams applied directly to the skin. The therapeutic compositions can be used to prevent radiodermatitis and sunburns, treat abrasions, itching, various types of burns, dermatitis, eczema, and difficult to heal wounds and ulcers. The cosmetic compositions most likely to range from 1 to 10% can be used to nourish dry and severely dry skin, to treat wrinkles and stretch marks and skin damaged by the sun. The cosmetic compositions should be marketed as hand and face creams, serums for the eye and lip areas, anti-wrinkle creams, after-sun creams, and body and moisturizing lotions.

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