COMBINING HYALURONIC ACID AND MESOTHERAPY TO BOOST RESULTS

Suisselle Laboratory unveils its new CHAC technology, which maximises hyaluronic acid's ability for skin renewal and collagen stimulation

CROSS-LINKED HYALURONIC Acid Compositions (CHAC) technology may be our newest, most powerful tool to deliver effective, long-lasting, anti-ageing outcomes. This innovative technology provides a way to create hyaluronic acid (HA) based products that can effectively and efficiently deliver reparative vitamins, oligopeptides, and amino acids to the skin. The mesotherapy products Apriline SKINLine and AGELine take full advantage of CHAC technology. They contain all of the necessary components to encourage the renewal of the skin and ensure an effective, long-lasting result.

How it works

The bioactivity of, and cellular stimulation by, HA has long been recognized in medicine. CHAC technology innovatively exploits this property of HA. Apriline's SKINLine and AGELine contain highly bio-available peptides, vitamins, and minerals that are integrated into the chains of hyaluronic acid. This is accomplished by a process called solid phase modification. Essentially, a 'graft' or complex of bio-regulatory molecules and HA is created in a clean, single-step reaction comprised of the joint actions of pressure and shear deformation. This mechano-stimulation of HA greatly favors the formation of active products making it superior to traditional, multi-step aqueous reactions (similar to that which occur in living organisms). CHAC technology virtually transforms HA molecules into powerful delivery vehicles of regenerative, bioactive vitamins, oligopeptides and amino acids; their unique composition and spatial structure ensure both superior transport and bioavailability once placed into the skin.

When complexed with HA, these bioreparative molecules can be transported into depleted cells via endocytosis due to HA's ability to interact with cellular membrane receptors. CHAC technology also allows for the creation of numerous different compositions of HA, each a distinct product containing different bioactive, low molecular weight regulatory molecules specific to the patient's needs that are homogenously distributed throughout.

Solid phase modification also produces inherently stable HA complexes, similar to crosslinking, providing protection from degradation by hyaluronidases. By way of this mechanism, they can act as a 'depot' of the biologic agent in the area where they're injected. This unique feature enhances their effect in the skin by providing a stockpile of necessary vitamins, amino acids, and oligopeptides for cellular repair and collagen production.

CHAC technology allows for complexing of partially soluble or insoluble vitamins (such as riboflavin) to a HA molecule, transforming them into a water-soluble form that is suitable for injection. In addition, CHAC technology enables HA to both stabilize and store volatile vitamins and amino acids (such as vitamin C and cysteine) that would otherwise become damaged and rendered useless under normal storage and sterilization conditions. Lastly, grafting of these bioregulatory molecules onto HA via physical methods gives the HA greater homogeneity.

How Apriline utilises CHAC technology

Both Apriline SKINLine and AGELine contain molecular compounds that actively participate in the cellular metabolism of the epidermis and dermis (*Table 1*). These vitamins, enzymes, peptides, minerals and plant extracts along with HA, provide the micro-nutrition necessary to stimulate collagen and elastin production by fibroblasts. In addition to their innate hydrating effect, these injected bioactive agents also exert an antioxidative effect to prevent skin ageing. They renew the extracellular matrix, actively stimulating communication and migration of different immune-competent cells. These

Table 1 Apriline SKINLine and AGELine molecular compounds and their functions

Bioregulatory Molecules	Function
Glutathione	A main antioxidant; activation of genes that regulate antioxidant defense
Amino acids: prolene, valine, glycine	Essential for reconstruction and resistance of collagen fibers and dermal elastin
Amino acid cysteine	Restores the epidermal barrier, regenerates glutathione
Vitamin C and Biotin	Collagen renewal, regulation of sebum secretion, cellular renewal
Peptide complexes	Cellular messengers, stimulate collagen synthesis, anti-inflammatory properties
Hyaluronic acid	Restores extracellular matrix and rebalances skin turgor; provides for optimal cellular metabolism

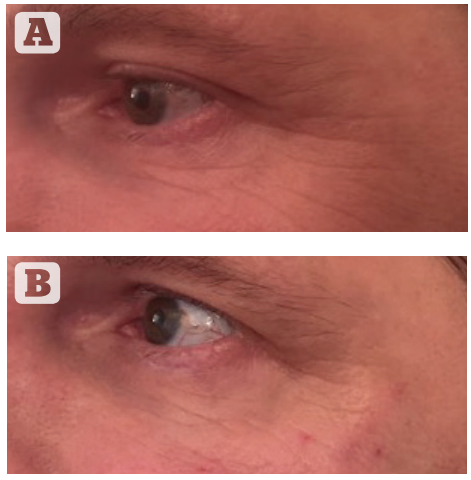

Figure 1 (A) Before, and (B) 60 days after treatment with mesotherapy for Crow's feet lines

processes require sufficient intake of antioxidants, amino acids, and cutaneous fatty acids. This is what makes products created with CHAC technology so effective. They optimize the extracellular milieu, which in turn optimizes cell signaling and communication between immune-competent cutaneous cells. Due to their powerful ability to restore, replenish, and maintain depleted stores of these elements, they not only promote but also enhance and provide a continued environment for youthful skin function in response to numerous environmental, oxidative stressors.

Therefore, products created with CHAC technology are optimally positioned to be used as a mesotherapy treatment. By precisely injecting these products into the dermis, they can provide ageing or depleted skin with the micronutrients necessary to reverse and prevent the signs of ageing.

Scientific evidence

The effectiveness of these products has been put to the test by a number of prominent physicians in various European countries. Recently, Dr. Paraskevov conducted an open label, single-center pilot study with Apriline's mesotherapy product—AGELine. Results were assessed independently by the injected patients, aesthetic doctor, and an independent observer. The scales used made it possible to quantify each studied parameter: improvement of the skin tone and radiance, and improvement of skin elasticity and reduction of fine wrinkles; with markings from 0 to 3 (0=no improvement, 1=minimal improvement, 2=moderate improvement, 3=significant improvement).

A total of 15 patients, aged 45–65 years with skin types between Fitzpatrick II and III and Glogau III and IV, received six mesotherapy procedures each spaced 15 days apart. Injections were made into the crow's feet. The injected product was Apriline AGELine, which contains hyaluronic acid, amino acids proline, valine and glycine, vitamin and antioxidant complexes, and oligopeptides. The volume injected at each session was 1.6 ml for both areas. Manual nappage technique was used with a 2 mm, 30 G mesotherapy needle. The amount injected at each point was 0.02 ml. Photographs were taken before the procedure, at one month and at three months post procedure so as to be able to demonstrate improvement in the skin tone, texture and a reduction in crow's feet fine wrinkles (*Figure 1*).

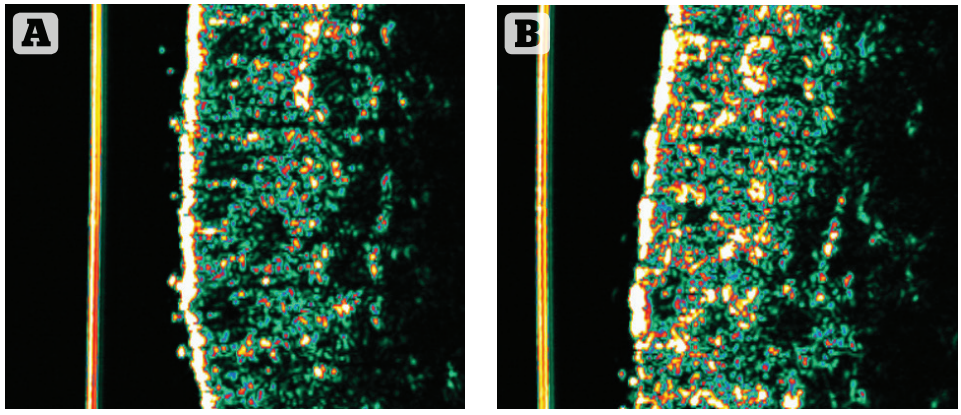

Figure 2 (A) Before, and (B) 60 days after treatment. Decreased optically empty spaces in the dermis indicating the increase in density.

Results of the study revealed a significant improvement in the skin tone and radiance (85% of patients), an improvement in skin elasticity (73% of patients) and reduction of fine wrinkles (65% of patients).

To further provide objective evidence of the rejuvenating effect of these mesotherapy products created with the CHAC technology, GREDECO Lab conducted an independent, open label multi-centered clinical study with the Apriline mesotherapy product AGELine. This study was carried out on 25 patients aged 46–62 years. Patients received three roller mesotherapy treatments spaced 30 days apart. The aim was to demonstrate the anti-ageing effect of Apriline AGELine by measuring the resultant stimulation of collagen production in the dermis. Dermal density was measured in the patients' right cheeks using the Monaderm ultrasound system (2D 20 MHz probe, 12.1 mm narrow-focus exploration, and acquisition and analysis software Advanced Control).

On average, ultrasound demonstrated a statistically significant increase (*Figure 2*) in dermal density after two mesotherapy sessions with a percentage of 45.2 versus 39.1 ($p=0.0068$). Hence, there was a 15.6% increase of the dermal density in patients treated with Apriline AGELine.

Further investigation will surely provide continued evidence of the power of products based on CHAC technology to deliver superior and consistent results in a number of different patient populations. These two, initial studies give us insight into the effectiveness and unique capability of these products. When integrated into a broader anti-ageing treatment paradigm with across-the-board products, pursuant to peeling or laser, these products fill a previously vacant niche and offer unprecedented and unparalleled ability to personalize and enhance our armamentarium.

Developed by Suisselle Laboratory, this exciting, new technology ingeniously capitalizes on the biocompatibility of HA, which allows for the creation of diverse yet stable products of varying molecular HA complexes. When adeptly delivered to the skin, as with mesotherapy, they provide long-lasting, vital 'depots' of essential vitamins, amino acids, and oligopeptides necessary for the cellular processes to repair and restore ageing skin. CHAC based products are efficient treatments that support and boost the skin's natural reparative and rejuvenative processes. Three Apriline products available on the market: HAIRLine, SKINLine and AGELine. Future products are in development and will soon be available.