KALINAT DNA

Powerful Antiage

Visible Antiwrinkle

Elasticity enhancer

Skin regulator

Avanced Biological technology

Kalichem Italia s.r.l.

KALINAT DNA

A NEW FUNCTIONAL ANTIAGE INGREDIENT

>> PRODUCT'S BACKGROUND

Kalinat DNA is a new, biologically active, functional ingredient. It is constituted by native deoxyribonucleic acid, that has been purified, depolymerized and neutralized with sodium ions. Several clinical tests, aimed to study its effects in the treatment of distinct types of lesions and cutaneous pathology, are evidence of the efficacy of nucleotide DNA fragments in delaying the formation and appearance of wrinkles and reducing all skin phenomena bound to aging.

>> MECHANISM OF ACTION

The cells facing *extreme metabolic conditions* represent the target of the Sodium DNA action. Sodium DNA is a polymeric Deoxyribonucleic Acid molecule able to penetrate the cells through a pinocytosis mechanism of action: once inside the cell, the nucleotides contained act as structural base for the nucleic acid and low Molecular Weight co-factors biosynthesis.
The result of such activity is a repairing action linked to the activation of the Immune system (stimulation of Cytokines and Growth Factors synthesis), to an increase of the protein synthesis of all the cells under stress or in particular metabolic alteration. The global action is of a homeostasis regulator able *to harmonize the protein level in the blood, preserve the mitochondrial integrity and regulate the energy produced in the cell.*
DNA-Na molecules penetrate the cells through the fibroblasts adenosine receptor by pinocytosis. This type of transport suggests that cells might use DNA-Na in order to perform their own DNA metabolism and as the structural basis for the synthesis of nucleic acids and their co-factors. These processes occur very easily in metabolic stressed cells, as is the case of aged skin cells.
KALINAT® ANTI-WRINKLE is a strong stimulator of cell repair and of aged tissues regeneration. As a result of its cell integration process, clinical tests demonstrated that DNA-Na contributes to reduce inflammatory symptoms, to stimulate epithelial and granulation tissue growth and to help the resolution of cutaneous micro-lesions

[Fig. 1]

>> STUDIES ON PROLIFERATION & CELL REPAIRING ACTION

S.Belletti et al.– Polydeoxyribonucleotide promotes Cyclobutane Pyrimidine Dimer repair in UV-B exposed dermal fibroblast.
E.Raposio et al.2008: in Vitro polydeoxyribonucleotide effects on human pre-adipocytes. Cell Prof 2008,41, 739-754.
S.Thellung et. Al 1999– Polydeoxyribonucletides enhance the proliferation of human

COSMETIC APPLICATION

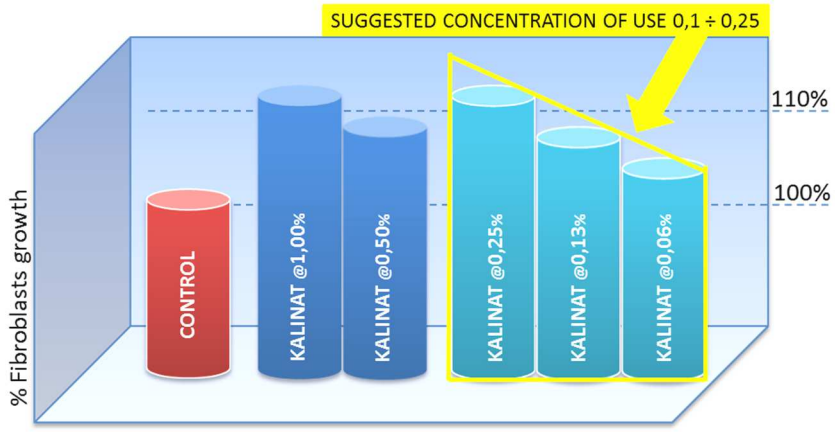
FROM SCIENCE THE BASE OF NEW RAW MATERIALS

The biological effects of Kalinat DNA suggest the use of the raw material in the anti-aging-aesthetic- healing fields for several applications, such as:

- **Elasticizing treatment** on the cutis, particularly in extremely delicate areas of the eye-contour- region and the areas more susceptible to wrinkle formation linked to collapsing dermis structures like collagen and elastin network.
- **Riepithelizing treatment** on all body areas, promoting a fast healing of the scar tissue
- Reduction of the typical **face red spots linked to alterations of capillaries** (typical aging process)
- Prevention of alterations of capillaries structure, with a **resulting reduction of events determining the formation of dark circles**
- Prevention treatment of **skin damages linked to UV-exposure** and **photo-aging.** Ideal as **soothing after-sun active** and **as anti-aging functional ingredient** in sun protection creams, as a result of repairing processes on the damaged DNA and proteins. Sodium DNA is, in fact, able to reduce the formation of CycloButane Pyrimidine Dimers (as shown in last paragraph study), whose harmful effects on human DNA take place not only during the sun exposure, but even during the night, as reported by a recent study carried out by Yale Medical school (*Douglas E. Brash et al. Chemiexcitation of melanin derivatives induces DNA photoproducts long after UV exposure. Science, February 2015 DOI:10.1126/ science.1256022).*
- **Reduction of ischemic events on the hands** (through a restoring action on the cell components of the local blood vessels) and a regenerative action on the dermis and epidermis components of the limbs suffering because of extreme environmental conditions (low temperatures, for example). This biological action makes such a raw material an ideal active ingredient for the hands and feet in terms of integrity prevention and stimulation of trophic activity.
- **Delivery system** of other active ingredients. Sodium DNA targets the cell components in stress phase. Its affinity and its polymeric character facilitate the delivery system action for further active substances in the interested affected areas.

ELASTICIZING ANTIWRINKLE ACTIVITY

IN VITRO TEST <<



Measurements have been carried out on keratinocytes and fibroblasts. These cell lines come from the biopsy of the healthy cutis of a donor. Such cells were included in six plates and incubated for 24, 48 and 72 hours. As negative control, the same cell line not treated was used.

The cell growth has been evaluated through spectrophotometers with the absorbance value of 540 nm, comparing the control and the treated cell line.

After 24 hours of Sodium DNA exposure, the test shows an increase of the proliferative activity on the fibroblasts, while the quantity of keratinocytes tends to increase after 72 hours of Sodium DNA exposure (used at a 1% concentration)

>> IN VIVO TEST

The tests have been carried out on an emulsion containing 0,25% of Sodium DNA. Following, the main results observed:

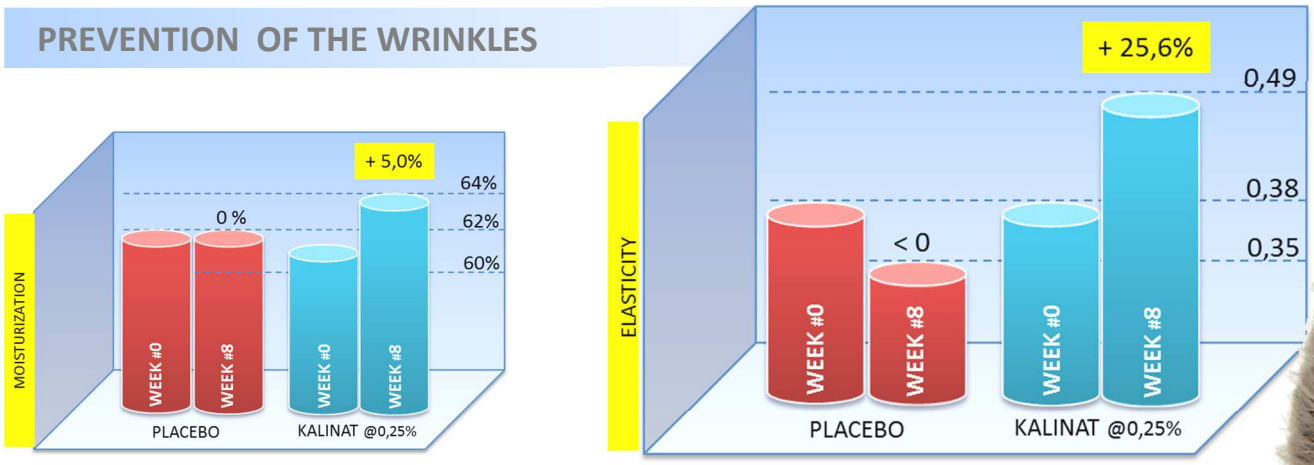
Elasticity increase of **26%** (linked to the repairing and regenerative action on the fibroblasts and on the collagen, elastin and extrafibrillar matrix production).
Cutaneous thickness increase of **9%** (linked to the repairing and regenerative action on the fibroblasts and on the collagen, elastin and extrafibrillar matrix production).
Increase of the moisturization of **5%** (linked to the Sodium DNA hydrophilic structure)
Reduction of skin roughness of **4%.**
The results show a statistically significant increase of cutaneous moisturization and a highly significant increase of the elasticity parameter that is a marker of skin biologic elasticity, showing an improvement of skin vitality and regeneration. The increase of the cutaneous thickness, with an improvement of the cutaneous fine lines and a statistically significant reduction of the maximum wrinkledness value, make the skin appear smoother and younger.

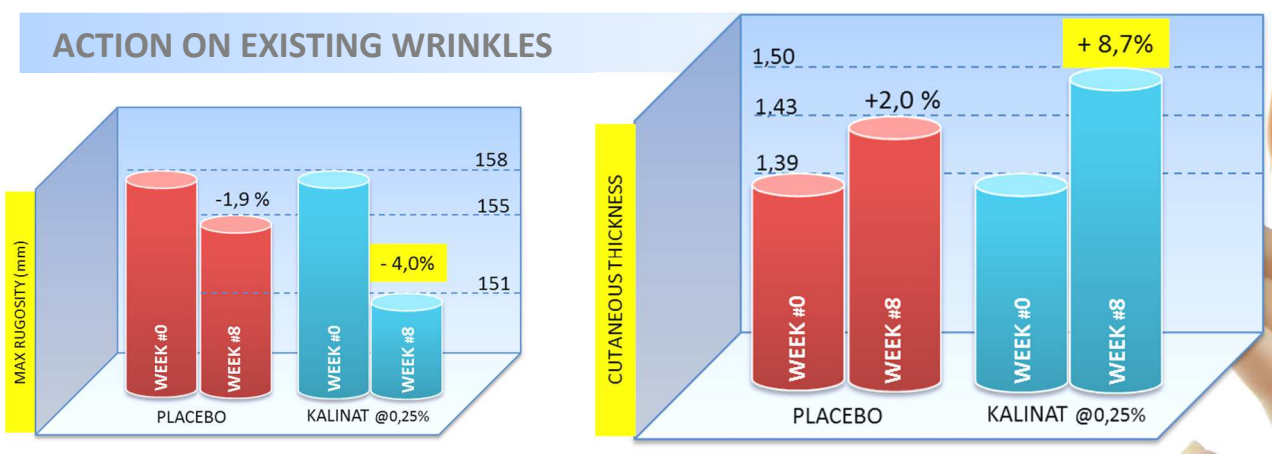
The above results observed in the tests, together with the pharmacological and clinical studies found in scientific literature make the raw material ideal for:

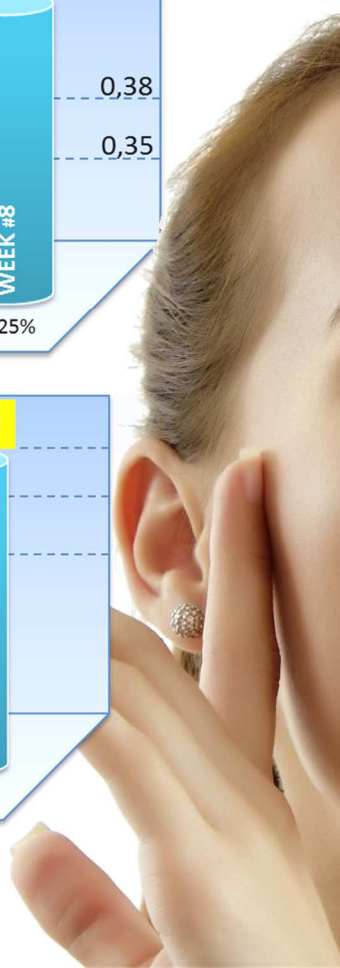
- **Powerful and immediate anti-aging treatments (antiwrinkle, elasticity enancher)**
  Because of the multi-faceted action shown at the dermis level.

- **Medical Cosmetic treatment**
  Linked not only to the action on fibroblasts, but also to its repairing activity on the blood vessels and its immune modulator action.
  The Sodium DNA targets all suffering cells, so it shows high affinity with every human tissue in stress and metabolic unbalanced phase.

As the fibroblasts are found in all the dermis area of the human connective tissue, Sodium DNA may also be used for any kind of metabolic alteration on the human skin



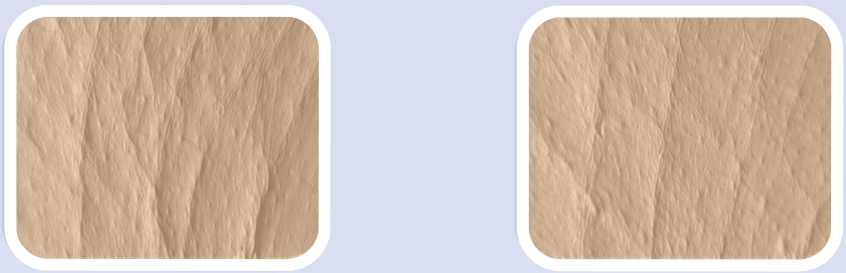




Skin aging is a serial process characterized by a sequence of changes in skin metabolism and by the accumulation of non-repaired damages of both biological or environmental origin. Structural changes and involution of connective tissue, progressive decay of elastic fibers and collagen take place. They are induced both by the decrease in cell turn-over, in the activity of fibroblasts and in the supply of nutrients that are triggered by the impaired cutaneous microcirculation and by the biological mistakes accumulated during aging. They are additive factors that heavily impair the skin properties, thus determining the irreversible aging phenomena. Besides the progressive reduction of structural components' functionality, the daily environmental stress to skin cells must be taken into account (UV and IR rays, osmotic stress, low moisture), making the cells susceptible to the exposure to thousands of free radicals. Moreover, psychological stress adds to the above picture, reducing body defenses and increasing susceptibility to free radicals attack. The consequent formation of wrinkles, initially narrow and progressively coarser, the thinning of the epidermal layer and the reduction of skin firmness and elasticity, gradually modify the properties and appearance of skin surface.

The extent of wrinkles on the skin before (initial control) and after (treated area) application of emulsion with KALINAT DNA

[Fig. 2]



BEFORE the treatment

AFTER the treatment

COSMETIC MEDICAL USE

The biological Sodium DNA showed affinity with all the cells of the human body, in particular with the cells subject to metabolic alterations. In scientific literature, the following applications are reported, in **dermatology**, it has been used for :

IMMUNE SYSTEM MODULATION <<

The raw material is recommended for treatments targeted to make the physiological cellular proliferation process more efficient in cases of Dermatitis, Psoriasis, Blotches, Scars, Chilblain, and as adjuvant in topical treatments linked to an immune system response alteration. Ideal for the development of creams, gels, serums and washes.

ULCER TREATMENT (AFTER RADIATION) <<

Linked to the anti-necrosis action determined by Sodium DNA. Ideal for the development of creams and gels creams, serums and gels.

>> SEVERAL CUTANEOUS PATHOLOGIES

(such as *stafiloderma, suppurative events, foruncolosis of the inferior limbs*) It showed a speeding of the treatment of 2.5 times. The raw material is highly recommended in the adjuvant treatment of such pathologies.

>> 2ND DEGREE BURNS

In case of burns, as emerged from the studies carried out in the first aid of Sklifosovskij in Russia, the Sodium DNA promotes re -epithelizing events within 7-10 days, through the use of bandages. On 2nd degree facial burns, it reduces of a couple of days the time for the formation of scar tissue. Sodium DNA is to be considered as a substance able to have a significant role in the local treatment of burns in inflammatory and repairing phase, without any side effect (Smirnov study).

>> GINECOLOGY

It can be used in the healing treatment of genital inflammations, itching events, in order to regularize the local bacterial flora, and the re-epithelizing treatment following vaginal mucous alterations. (Studies carried out with Sodium DNA in solution at 0.25% show a regularization of the local bacteria and a fast re-epithelization of the tissues in case of erosions of the cervical tissue). Ideal for the development of creams, gels, washes.

>> DELIVERY SYSTEM

DNA targets the cell components in stress phase. Its affinity and its polymeric character facilitate the delivery system action for further active substances in the interested affected areas.

>> SKIN DESEASES

Studies carried out in Ekaterinburg (Mel'Nikov D.Ju.) on 4 subjects aged between 30-35 years, affected by psorias since at least 10 years show the following results: after a few months one subject had a dissolution of the psoriatic plaques, with stabilization after 11 months. The treatment was parenteral. Another subject after 8 months had the same result, without using any kind of ointment. Regardless the dimension of the wounds, the use of 225-300 mg eliminates the itching sensation, whereas the use of higher dosages eliminates the psoriatic triad and normalizes the cutaneous elasticity. The product for external use eliminates the sensation of pain and stimulates cicatrizing events.

>> IN NORMALIZING MICROCIRCULATION

It has been showed that Sodium DNA is able to stimulate the epithelization of the wounded skin, normalize the blood vessels through a regenerative action on the cellular component of the capillaries, restore the ideal blood circulation in ischemic tissues. Its action on the capillary micro-circulation can be exploited to prevent and attenuate events like dark circles formation and microcirculation alterations which can cause the formation of aging-related red spots. Ideal for the development of creams, serums and gels.

TOLERABILITY

Toxicological reports suggest that there are no side effects following the use of Sodium DNA. No contraindications were observed and the molecule is well tolerated also in high dosages .

WAY OF USE

	RANGE
pH of use	5,0 ÷ 8,0
Concentration of use in COSMETICS	0,1 ÷ 0,5
Concentration of use in MEDICAL COSMETICS	0,2 ÷ 0,5

EXAMPLE OF FORMULATION >> ANTIWRINKLE CREAM

Phase	INCI NAME	% p/p
1	**ETHYLHEXYL PALMITATE**	**8**
2	**POTASSIUM OLIVOYL HYDROLYZED OAT PROTEIN, CETEARYL ALCOHOL, GLYCERYL OLEATE, GLYCERYL STEARATE, AQUA** (OLIVOIL AVENATE EMULSIFIER - Kalichem Italia)	**9**
3	**ISOPROPYL MYRISTATE**	**6**
4	**CETYL ALCOHOL**	**4,5**
5	**DIMETHICONE**	**1**
6	**AQUA**	**60**
7	**GLYCERIN**	**3,15**
8	**AQUA, UREA, GLUCOSE, SODIUM PCA, SORBITOL, FRUCTOSE, HYDROLYZED WHEAT PROTEIN, SODIUM GLUTAMATE, GLYCINE, LYSINE, MALIC ACID, TARTARIC ACID, CITRIC, ACID, GLYCOLIC ACID, LACTIC ACID** (KEMIDERM NMF - Kalichem Italia)	**4,5**
9	**SODIUM DNA** (KALINAT DNA - Kalichem Italia)	**0,25**
10	**AQUA**	**3.6**
		100.00

PRODUCT SPECIFICATION

INCI NAME and COMPOSITION	RANGE %
SODIUM DNA	≥ [%] 75%

PHYSICO - CHEMICAL ANALYSIS	METHOD	LIMITS
APPEARANCE	Internal	NON HYGROSCOPIC AMORPHIC POWDER
COLOUR	Internal	WHITE
ODOUR	Internal	ODORLESS
pH (SOL.1,5% Wat.+0,1%NaCl)	Potentiometric	6,2 ÷ 10,0
DNA CONTENT	Internal	86,0 ÷ 100,5
TOTAL MICROBE COUNT	by inclusion Ph. Eur. 7.0	0 ÷ 100

SHELF LIFE : 36 months
STORAGE CONDITIONS: Keep in original containers well closed in a cool (minimum suggested temperature 14°C max 27°C), dry, well ventilated, dark and clean site.
BIODEGRADABILITY: readly biodegradable

KALINAT DNA

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