Fucoreverse™

Reversing the signs of ageing

LESSONIA
cosmetics + ingredients

THE UNIQUE COMPOSITION OF **Fucoreverse™**

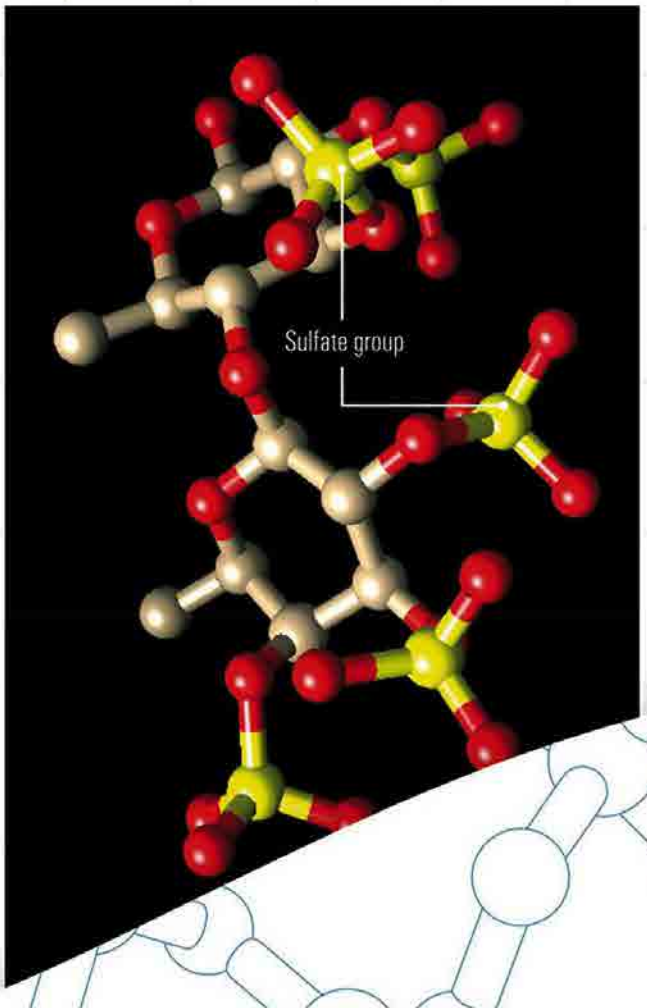
WHAT ARE FUCOIDANS?

Fucoidans are polymers composed mainly of sulfated fucose. They are high molecular weight molecules: 50 to 1000 kDalton.
They are known to demonstrate a wide range of biological activities including stimulation of the cellular metabolism and immunomodulation.

FUCOREVERSE™ GLYCOTECHNOLOGY:

Using the unique technology developed by LESSONIA the fucoidans can be hydrolysed until an extremely low molecular weight is obtained. Fucoreverse™ is a combination of fucose mono-, di- and trimers.
The molecular weight is below 2 kDa. The second interest of this technology is to saturate the fucose molecules in sulfated groups.

The diagram below shows the lowest possible molecular weight and the highest degree of sulfation.



CONSEQUENCES ON BIOLOGICAL ACTIVITY

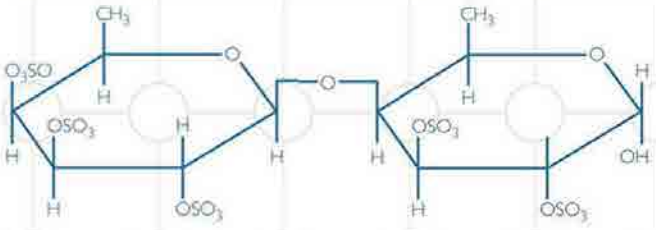
The biological activity of fucoidan derivatives is in inverse proportion to the molecular weight of these molecules. Thus the fucoidan derivative is more biologically active when the saccharide chain is short.

The biological activity is also in direct correlation to the fucoidan derivative's degree of sulfation. In effect it is these sulfated derivatives which, by attaching themselves to biological receptors, lead to cosmetic activity.

For these reasons, Fucoreverse™ is the most biologically active form of fucoidan.

SKIN ABSORPTION:

Certain cosmetic agents found on the market are made with high molecular weight fucoidans and certain others said to be of low molecular weight are only partially hydrolysed (in the order of 10 kDa). While certain biological activities have been proved at this level, it is however essential to carry out a more selective hydrolysis and a higher degree of sulfatation to obtain agents which can be fully exploited. The composition of Fucoreverse™ is unique on the market.



MARINE GLYCOBIOLOGY

CELLULAR COMMUNICATION: THE ROLE OF GLYCOBIOLOGY

For many years the cosmetic industry has focused its attention on peptides and their capacity to attach themselves to cellular receptors, thereby propagating biological messages. Peptides, however, are not the only molecules to have these properties. Certain specific oligosaccharides such as fucoidan also play a similar role, thus demonstrating alternative biological modes of action which we call "glycobiology".

One of the major promises made by glycosciences is the identification of communication phenomena via the specific sugars of the cellular membranes and via the sugars of the extracellular matrix, to adapt the specific action of the active ingredients to certain applications.

The potential cosmetic applications which could result are attracting an increasing number of researchers who see in the "biological intelligence" of these oligosaccharides a revolution in our knowledge about the skin's metabolism. All these sugar chemical messengers are naturally present in the body and are synthetized using 8 essential sugars of which fucose is an important one.

ALGAE FROM THE IROISE SEA

UNIQUE MOLECULES IN UNIQUE HABITATS

Fucose is the major constituent of a high molecular weight polymer called fucoidan. The specificity of the fucoidans present in the cellular membranes of Laminaria from the Iroise Sea (Britanny coast, France) is their high sulfated fucose content. This laminaria has developed a defense system enabling it to resist the extreme conditions of the Iroise Sea (storms, ocean currents and very high tides). The fucoidan structure in the cell walls of these algae plays a protective and restorative role in rebuilding the tissues after a storm. The capacity of these molecules to protect and repair cells was a source of inspiration for LESSONIA.

Because of their high molecular weight, fucoidans are not biologically active on the skin in their native state.
Marine glycotechnology involves hydrolysing these polysaccharides to obtain precise fractions of biologically active oligosaccharides. It was in this context that LESSONIA researchers, experts in marine glycobiology, discovered the new cosmetics applications of marine oligosaccharides.

IN VITRO TESTS

FUCOREVERSE™ - MECHANISM OF ACTION

The extracellular matrix in the dermis is composed of a molecular network (collagen, elastin and glycosaminoglycans) between the fibroblasts which ensures the skin's structure and tone. When the deterioration and the repair of this network are not equal, wrinkles appear and the skin loses its firmness.

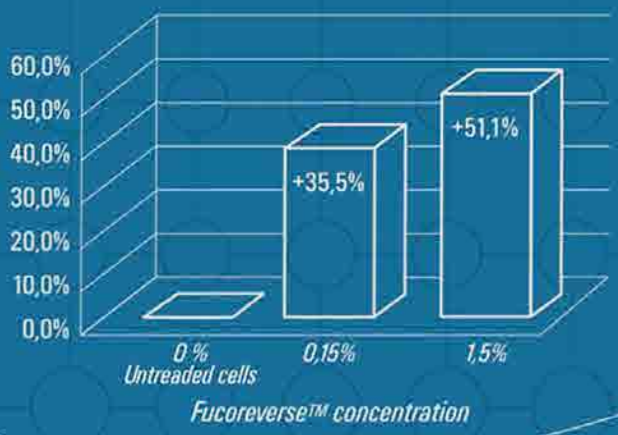
Fucoidans protect this network by blocking the enzymes responsible for the deterioration of the extracellular matrix as well as the pro-inflammatory cytokines which damage the collagen. Fucoreverse™ also acts as a repairing agent by stimulating the metabolism of the fibroblasts and collagen synthesis. With these 2 synergistic actions, Fucoreverse™ helps the signs of ageing to be reversed by bringing back the skin's structure and firmness.

FUCOREVERSE™ STIMULATES FIBROBLAST PROLIFERATION

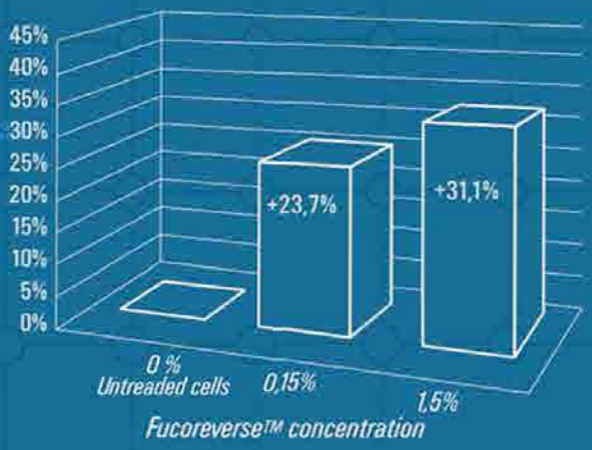
Protocol:
A culture of human dermal fibroblasts in contact with different doses of Fucoreverse™. Measurement of cell viability and cell proliferation in comparison to non-treated fibroblasts.

Results:
A significant increase in the proliferation of fibroblasts compared to the non-treated group of: +35.5% in the 0.15% dose; 51.1% in the 1.5% dose.

FIBROBLAST PROLIFERATION



TYPE 1 COLLAGEN SYNTHESIS



FUCOREVERSE™ STIMULATES TYPE I COLLAGEN SYNTHESIS

Protocol:
Measurement of extracellular collagen synthesis using a culture of human dermal fibroblasts in contact with Fucoreverse™.

Results:
Fucoreverse™ has a significant stimulatory effect on collagen synthesis compared to the non-treated control group: +23,7 % in the 0.15% dose; +31,1 % in the 1.5% dose.

Fucoreverse™ stimulates the skin's cellular metabolism as shown by the fibroblast proliferation and collagen fiber synthesis measurements.

CLINICAL TESTS

Protocol:

42 volunteers aged between 50 and 65 years old with crow's feet wrinkles.
Divided into two groups according to the randomisation lists: active product or placebo.
Application of a cream containing 1.5% Fucoreverse™ against placebo twice daily for 28 days.
Analysis of wrinkle depth of crow's foot area, using a non-invasive skin bioengineering technique.
Analysis of irritant potential.

Results:

EFFICACY OF FUCOREVERSE™ ON THE CROW'S FOOT AREA AFTER 28 DAYS.

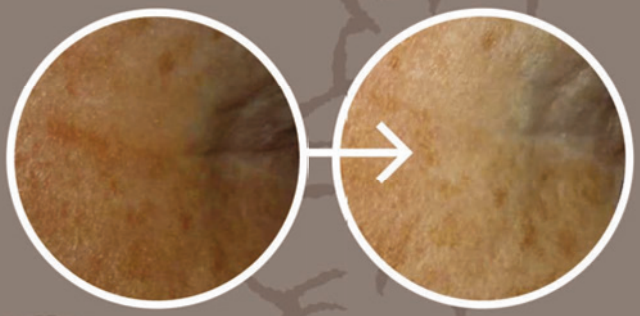
After using 1.5% Fucoreverse™ twice daily for 28 days, 70% of volunteers from active group observed a reduction in the main wrinkles **up to -18.9%.**

For the active group with 1.5% Fucoreverse™:
A statistically significant decrease in average wrinkles depth at day 28 compared to baseline.

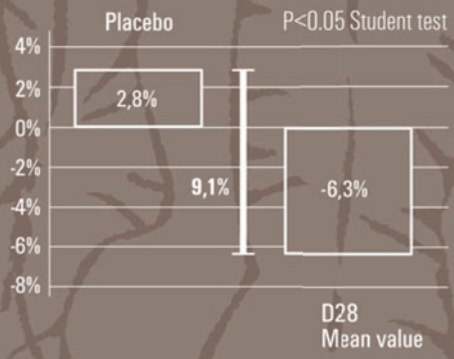
For the placebo group:
An increase in average wrinkles depth at day 28 compared to baseline.

Statistics show that Fucoreverse™ significantly decreases the depth of crow's foot wrinkles by 9.1 % on average, versus placebo.

MACROPHOTOGRAPHY: EFFECT OF 1.5% FUCOREVERSE™ ON CROW'S FEET WRINKLES.



DEPTH OF CROW'S FOOT WRINCKLES (+ 28 days)



EFFICACY OF FUCOREVERSE™ ON THE ANTI-IRRITANT PROPERTIES

Statistics show that Fucoreverse™ significantly decrease irritations and redness, versus placebo.
These results show the use of Fucoreverse™ to calm sensitive skin.

Thanks to its unique composition, Fucoreverse™ acts by regulating the balance between deterioration and repair of extracellular matrix to decrease the wrinkles and the redness on the skin, thereby reversing the signs of ageing. Wrinkle depth is significantly reduced in comparison to a placebo group.

COSMETIC ACTIONS:

Anti-ageing
Firming
Rejuvenation of fibroblasts
Stimulation of collagen synthesis
Reduction of wrinkles
Sensitive skin treatment

INCI NAME:

On request

MATERIAL INFORMATION:

Appearance: yellowish liquid
Solubility: water soluble
Recommended % of use: 1.5%
Preservatives: Benzyl alcohol & dehydroacetic acid

China-compliant