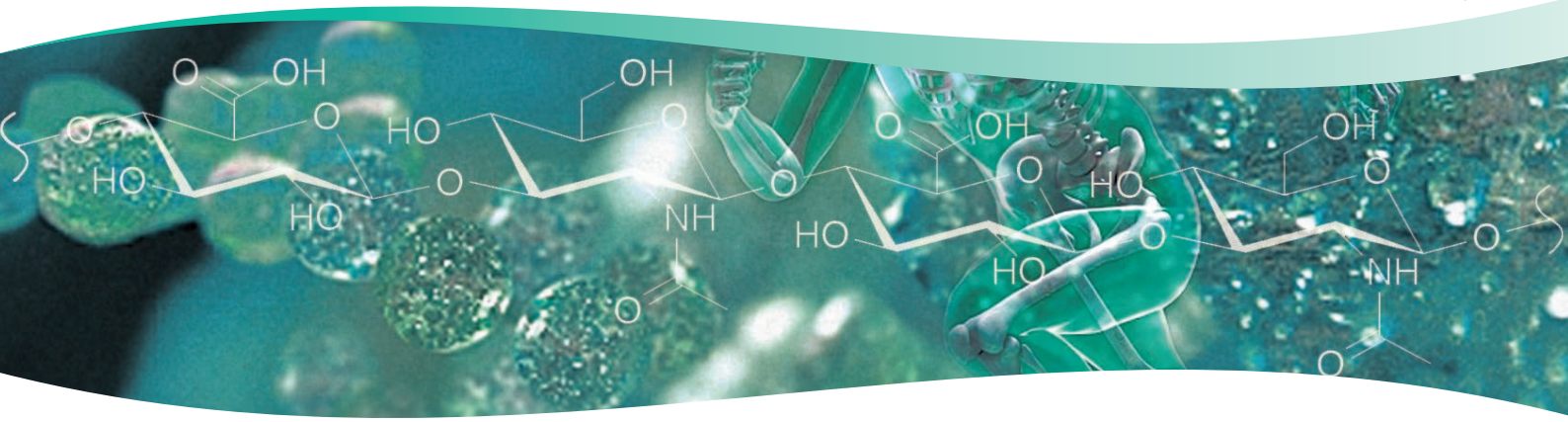
hialusol™

solchem®



Product Description

Hialusol™

INTRODUCTION

Hyaluronic acid is a mucopolysaccharide present in our body, particularly in the subcutaneous tissue. For this reason, it has been widely used as a cosmetic ingredient thanks to its high moisturizing properties.

50% of hyaluronic acid synthesized by the body is naturally located in the epidermis where is metabolized and excreted within 24 hours. Over the years our body synthesizes less hyaluronic acid. When we have 20 years old our epidermis contains 100% hyaluronic acid but the percentage drops to 65% at 30's, 45% at 50's and to 25% at 60's. Consequently, the skin ages, weakens and loses moisture.

In addition, hyaluronic acid is a component of synovial fluid of the joints, where it functions as lubrication, absorbs impacts and facilitates the supply of nutrients. It is also found in the hyaline cartilage and the extra-cellular matrix.

ORAL USE OF HYALURONIC ACID: evidence of efficacy in joints

The main use of hyaluronic acid is topical application, given the proven efficacy on the skin when used as cream or ampoules.

Hyaluronic acid has also been used as medicine for the treatment of joint inflammation, as it is able to suppress inflammation when applied by intra-articular injection. However, the anti-inflammatory effect of hyaluronic acid when administered orally remains controversial because of the lack of evidence on bioavailability.

Recent research has found that hyaluronic acid, when administered orally, can promote the expression of TGF-ß (growth factor beta transformation) in plasma, which induce the suppression of the production of PGE2 (prostaglandin E2) and / or bradykinin, all inflammatory and pain mediators.

Although it not clear completely what the mechanism of action by which oral intake of hyaluronic acid regulates the expression of TGF-beta in plasma is, a study in mice showed that hyaluronic acid binds to a receptor protein present in the intestinal epithelial surface. This binding stimulates the expression of DNA of the cell for the production of TGF- β, increasing its plasma concentration.

TGF- β is a mediator protein that cells secret to controls various functions in other cells by the binding to surface receptors of cell membrane. When TGF-β binds to its

specific receptor produces a chain of reactions within the cell, including the suppression of production of PGE2 and bradykinin.

From the results obtained in the animal study, it was conducted an experiment was carried out with a cell culture model, using cells from human colon, in order to confirm the production of TGF- β in humans mediated by hyaluronic acid.

Cultured cells were incubated in medium containing hyaluronic acid of different molecular weight: 8.000, 50.000 and 800.000 Da. The results showed that mRNA production (containing information for making TGF- β) was directly related to the molecular weight of hyaluronic acid present in the culture media.

After 24 hours of incubation with the different hyaluronic acids, the results demonstrated that the hyaluronic acid of high molecular weight (800.000 Da) presented the higher increase in production of mRNA for TGF- β with a value 2.14 times compared to the control group and compared also to the other two molecular weights (8.000, 50.000 Da).

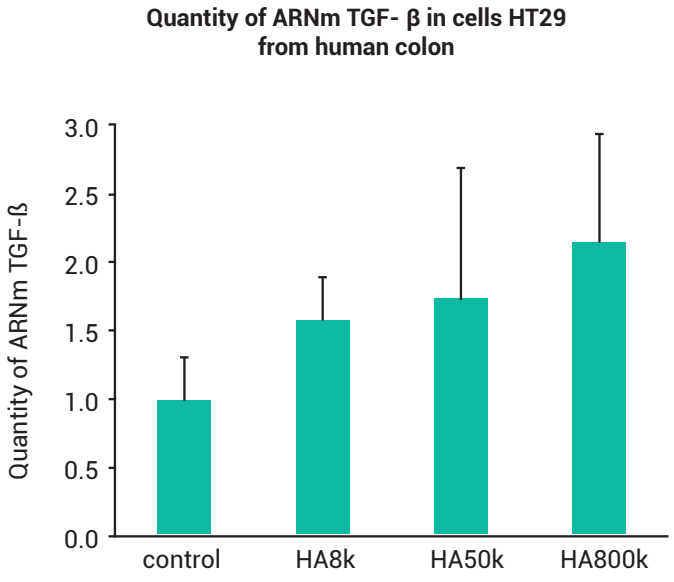


Fig. Stimulation of production of ARNm TGF- β in cells HT29 from human colon incubated in acid hyaluronic of different molecular weight.

This in vitro study shows that the binding of hyaluronic acid to receptors present on the surface of the intestinal epithelium, can lead to an anti-inflammatory action through a cascade of biochemical reactions. This biochemical reactions have as result the suppression of pain sensation as well as the oedema suppression associated with inflammation, without the need to be absorbed by the intestinal cells.

In addition, the study evidences that hyaluronic acid of high molecular weight is the only one that may have greater anti-inflammatory action.

HIALUSOL™

Hialusol™ is hyaluronic acid produced by the microorganism *Streptococcus zooepidemicus* through a fermentation process.

The main feature of Hialusol™ is its high molecular weight greater than 1.000.000 Da, which according to evidence from the *in vitro* study presents an antiinflammatory efficacy on joints when used orally.

Due to the process of obtention Hialusol™ is suitable for vegans.

RECOMMENDED DOSE

From the different studies with hyaluronic acid, a daily dose between 20 and 50 mg of Hialusol™ it is recommended.

BIBLIOGRAPHY

Will the real hyaluronan please stand up? Review. Luke R. Bucci, Ph.D., CNS, CCN and Amy A. Turpin, M.Sc. *Journal of applied nutrition, volume 54, number 1, 2004.*

Hyaluronic acid (hyaluronan): a review. J. Necas, L. Bartosikova, P. Brauner, J. Kolar. *Veterinarni Medicina, 53, 2008 (8): 397–411.*