

Beta-Glucan – A Multi-functional Skin Care Active

Authors: Dr. Ravi Pillai, Symrise Inc, NJ, USA. Dr. Joachim Röding, Symrise GmbH & Co KG, Hamburg, Germany
Dr. Mark Redmond, Ceapro Inc, Alberta, Canada

Abstract

Oat has been traditionally used to successfully treat a wide range of skin ailments. The Beta-glucan (sold as SymGlucan) used in our studies is made from selected oat bran. It is a water-soluble polysaccharide consisting of linear chains of glucose residues with 1,4- & 1,3- linkages and has a molecular weight of about 1million Da. We have done series of studies, which show that SymGlucan is a multi-functional ingredient suitable for topical skin care.

In our first study we looked at the penetration behavior of Beta-glucan on intact skin by using human skin models. The presence of Beta-glucan was monitored by fluorescence staining with Calcofluor White. Our studies showed that, despite its fairly large molecular size, Beta-glucan has deeply penetrated into the skin.

A moisturisation test was conducted on a panel of 30 human subjects with two emulsion formulations - one containing Beta-glucan and the other with Hyaluronic acid. The moisture level was measured at specific intervals with a conductivity meter. The results showed that the Beta-glucan is an excellent moisturiser and provides even better long-term moisturisation than Hyaluronic acid.

A clinical study was done to evaluate the ability of Beta-glucan to alleviate the extrinsic signs of aging on a panel of 27 subjects with two gel formulations - one with Beta-glucan and the other a placebo. After 8 weeks of treatment, a digital image analysis showed that there is a clear improvement in the fine lines and wrinkles of the subjects.

Introduction

Oat has traditionally been used to successfully treat a wide range of skin ailments. A typical Oat grain consists of proteins and starch among other things. Beta-glucan is the structural element between the hull and endosperm of Oat grains (Fig. 1). The Beta-glucan (SymGlucan) used in our studies is made by a patented process from selected Oat bran.

Oat Beta-glucan is a water-soluble polysaccharide consisting of linear chains of Glucose residues with 1,4- & 1,3- linkages and has a molecular weight of about 1million Da (Fig. 2). A 1% solution of Beta-glucan (SymGlucan) gives a viscous, clear to opal product which is used in all our studies.

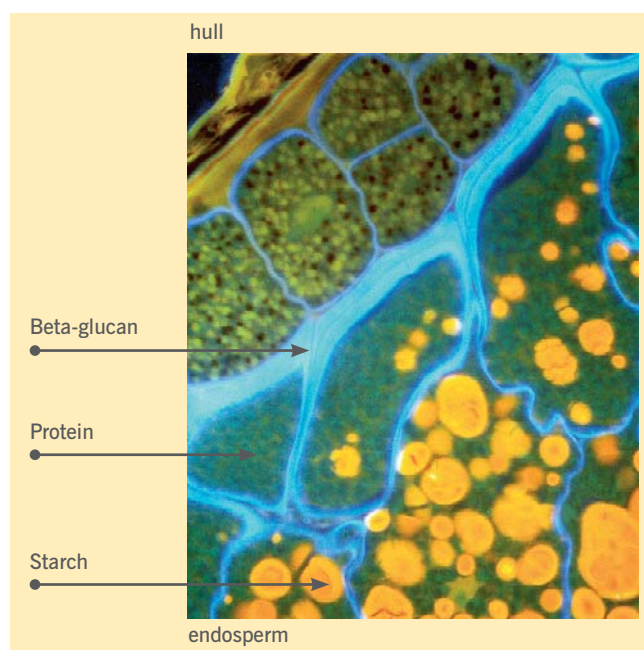


Figure 1: Cross-section of Oat grain

Several experiments have shown that Beta-glucan is a biological response modifier. A Beta-glucan collagen matrix dressing for the management of partial thickness burns and shallow abrasion-type wounds is currently available in the market. There are studies which showed that Beta-glucan stimulates an increase in procollagen. People who have been using Beta-glucan topically have described various cosmetic benefits including increased moisturisation, less wrinkles and appearance of smooth skin. Since Beta-glucan is a fairly large molecule, we wanted to evaluate if it could penetrate intact human skin and thereby interact with macrophages and fibroblasts. We have also carried out studies to evaluate the moisturisation and anti-wrinkle efficacy of Beta-glucan.