

key to anti-aging hair care volumizing Hydrating film former + moisturizing with efficacious antioxidant protection

BACKGROUND

Hydrolyzed proteins such as soy, wheat or oat have been used to impart conditioning benefits and film-forming properties to the hair for decades. These hydrolysates are comprised of random amino acid sequences that aid in improving the elasticity, texture, and hydration of the hair. Recent efforts within the Nutritional Industry have focused on the selection of more precise protein fragments to improve the benefits of supplements. In the course of that research, it has become clear that protein fragments from different sources have varied benefits. To use the verbiage of Malcolm Gladwell, one of the "Outliers" is Pisum sativum - protein that is all the buzz within the nutrition industry.

ACB Pisum Sativum Peptide is a hydrolyzed pea protein that utilizes a novel technology to provide all the benefits of hydrolyzed proteins and then some. This product provides antioxidant, anti-aging, hydrating and smoothing benefits to the skin and hair. Not only that, but it also provides volumizing benefits when used in hair care formulations! Pisum sativum continues to gain attention from Nutrition and Health advocates for being a plant-based, hypo- allergic protein with high nutritional value. This popular protein has now crossed over into cosmetics as a quality alternative to other vegetable proteins but with profound benefits.

SCIENCE

Proteins are traditionally hydrolyzed, using acids, alkalis and enzymes or a combination to produce random amino acid sequences. While traditional methods of hydrolysis are well accepted and effective, they are simplistic efforts to duplicate normal cellular protein catabolism whereby cells digest proteins into specific sequences to meet nutritional needs. Active Concepts has harnessed the digestive abilities of a non-GMO bacterial strain, *Lactobacillus bulgaricus*, to produce **ACB Pisum Sativum Peptide** with a controlled molecular weight of approximately 750 Da. For decades hydrolyzed proteins, such as soy, wheat and oat, have been used to deliver conditioning benefits and film forming properties to cosmetic formulations. As these traditional proteins with greater benefit are needed.



Code Number: 16810

 INCI Name: Pisum Sativum (Pea) Peptide
INCI Status: Conforms
REACH Status: Complies
CAS Number: 90082-41-0
EINECS Number: 290-130-6

Origin: Botanical **Processing: GMO** Free No Ethoxylation No Irradiation No Sulphonation Additives: Preservatives: None Antioxidants: None Other additives: None Solvents Used: Water **Appearance:** Clear to Slightly Hazy Liquid Soluble/ Miscible: Water Soluble **Ecological Information:** 87.30% Biodegradability Microbial Count: < 100 CFU/g, No Pathogens

Suggested Use Levels: 1.0 – 5.0% Suggested Applications: Anti-aging Hair and Skin Care, Antioxidant, Volumizing, Smoothing, Hydrating

Benefits of ACB Pisum Sativum Peptide:

- Anti-Aging Skin & Hair Care
- Maximizes Hair Volume
- Scalp and Follicle Health
- Increases Hydration
- Antioxidant Protection

BENEFITS

Anti-Aging is the latest trend in Hair Care. **ACB Pisum Sativum Peptide** can effectively condition and moisturize the skin and hair, keeping them both healthy and nourished. Free radical and UV damage can also accelerate the aging process thus making the appearance of fine lines and wrinkles more noticeable. The aging process is also accompanied by dry skin and hair. Both of these can be counteracted with the antioxidant and moisturization benefits of **ACB Pisum Sativum Peptide**. **ACB Pisum Sativum Peptide** targets anti-aging so vibrant, healthy skin and voluminous hair can shine through.

EFFICACY DATA

Not all proteins are created equal, the industry use of what as the standard is long overdue to be reexamined. Pea's score over 20 points higher on their amino acid composition (on the nutritional index) and as Malcolm Gladwell stated, different Amino Acids carry different benefits. Pea's have a unique composition of Amino Acids, this made sourcing **ACB Pisum Sativum Peptide** an easy choice. In addition to containing a significant amount of every amino group, Pea's have excellent levels of Lysine that is not only naturally occuring, but can be synthesized from their superior Aspartic Acid content.



Typical Amino Acid Composition

Figure 1. Typical Amino Acid Composition.

One of the largest differentiators of *Pisum Sativum* is its natural antioxidant capability. Due to its high concentration of Lysine based amino acids, it exhibits extraodinary protection against free radicals. An ORAC study conducted on **ACB Pisum Sativum Peptide** showed its capability of reducing the presence of Reactive Oxygen Species compared with Trolox, the vitamin E analog used as the control. The ORAC value of the other protein hydrolysate show no antioxidant capacity. **ACB Pisum Sativum Peptide** provides strong antioxidant attributes to deliver more than just moisturizing and conditioning benefits to the hair.







Voluminous hair is an excellent signifier of hair health, by treating with **ACB Pisum Sativum Peptide** vs. the standard wheat control it has become clear just how different amino acids are capable of effective hair. A study conducted at Gaston College Technology Center measured the diameter of color treated hair at different intervals to determine an increase in hair thickness. Using 60 strands of hair, a 2.0% solution of **ACB Pisum Sativum Peptide** was applied to each strand of hair. Immediate results showed an average increase in hair diameter of 14.0% with an average increase of 13.65% four hours after application.

After placing individual hair strands under a microscope, Microscopy Imaging of the individual strands were taken to visually demonstrate the increase in hair diameter achieved when using **ACB Pisum Sativum Peptide** in comparison to the use of Wheat Hydrolysate.



Figure 3. Individual strand immediate following treatment with Wheat Hydrolysate.



Figure 4. Individual strand immediately following treatment with **ACB Pisum Sativum Peptide**.



Figure 5. Individual strand four hours after treatment with Wheat Hydrolysate.



Figure 6. Individual strand four hours after treatment with ACB Pisum Sativum Peptide.



Figure 7. Increase in hair diameter following the initial and +4 hours application of ACB Pisum Sativum Peptide and Hydrolyzed Wheat Protein.

In addition to hair diameter, a half head study was conducted in order to determine the comparison of using a shampoo incorporating **ACB Pisum Sativum Peptide** vs. a control shampoo, in addition to the comparison of using a conditioner incorporating **ACB Pisum Sativum Peptide** vs. a control conditioner. The images of the half head study were used in conjunction with a sensory assessment subjectively rating the parameters - cleansing, smoothing, dry and wet combability, anti-frizz, overall feel, shine and hydration. This assessment was conducted both before and after treatment.

Based on the results obtained, **ACB Pisum Sativum Peptide** is capable of enhancing wet and dry combability, anti-frizz, overall feel, shine and hydration of the hair. The professional stylist who performed the actual tests by applying the product, styling the hair and documenting the images said **ACB Pisum Sativum Peptide** is great for improved hydration and shine of the hair. It was also reported that this product helped enhance volume and did not weigh hair down. Perfect for use in treatments to enhance shine and hydration for healthier hair.



Figure 8. Rating of hair characteristics following sensory assessment.

Comorrow's vision...Today!

Technical Data Sheet

ACB Pisum Sativum Peptide





Figure 9. Full head Baseline, Untreated Hair.



Figure 11. Full head Baseline, Untreated Hair.



Figure 13. Full head Baseline, Untreated Hair.



Figure 10. Half-Head Treated.



Figure 12. Half-Head Treated.



Figure 14. Half-Head Treated.







Increase in Hair Hydration

ACB Pisum Sativum Peptide is active at a cellular level, improving the molecular makeup of hair and skin. As shown in Figure 16, **ACB Pisum Sativum Peptide** exhibited positive collagen synthesis activity. The increase in collagen production may lead to improvement in the dermal-epidermal junction integrity as well as an improved scaffolding matrix. For these reasons, we can assume **ACB Pisum Sativum Peptide** is suitable for cosmetic applications designed to boost collagen synthesis to aid in providing a younger and healthier complexion.



Sirius Red Fast Green Assay

Tomorrow's vision...Today!

Figure 15. Improvements in Hair Hydration.

Figure 16. Sirius Red Fast Green Assay.

Active Concepts Tomorrow's vision... Today!*

ACB Pisum Sativum Peptide

Cellular Viability



In dealing with cellular activity it is important to note any harm or changes occuring at these levels. In this study, **ACB Pisum Sativum Peptide** was tested to evaluate its effects on the viability of normal human dermal fibroblasts (NDHF). At concentrations of both 0.1% and 0.01% **ACB Pisum Sativum Peptide**, nor the preservatives contained therein exhibited any inhibition of cell viability. It can therefore be concluded that at normal use concentrations **ACB Pisum Sativum Peptide** is not cytotoxic. The data obtained from this study met criteria for a valid assay and the controls performed as anticipated.



TGF- β ELISA

Figure 18. TGF-Beta expression.

By using a standard TGF-Beta ELISA, we have been able to test for TGF-Beta concentration, a compound responsible for several cell signaling pathways, and more importantly a major control in apoptosis and cell viability. **ACB Pisum Sativum Peptide** concentration was strongly correlated with lower overall concentration of TGF-Beta. This indicates that **ACB Pisum Sativum Peptide** has the capacity to influence cellular viability by decreasing the rate of apoptosis.



Information contained in this technical literature is believed to be accurate and is offered in good faith for the benefit of the customer. The company, however, cannot assume any liability or risk involved in the use of its chemical products since the conditions of use are beyond our control. Statements concerning the possible use of our products are not intended as recommendations to use our products in the infringement of any patent. We make no warranty of any kind, expressed or implied, other than that the material conforms to the apolicable standard specification. Freedom from patent infringement in to implied. All information is for investigative purposes only.