

# ACB Pisum Sativum Peptide



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

## 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 2000 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 continue to fall out of favor, due to pressure from consumers, new and exotic 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

# ACB Pisum Sativum Peptide

## 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 re-examined. 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 occurring, but can be synthesized from their superior Aspartic Acid content.

Typical Amino Acid Composition

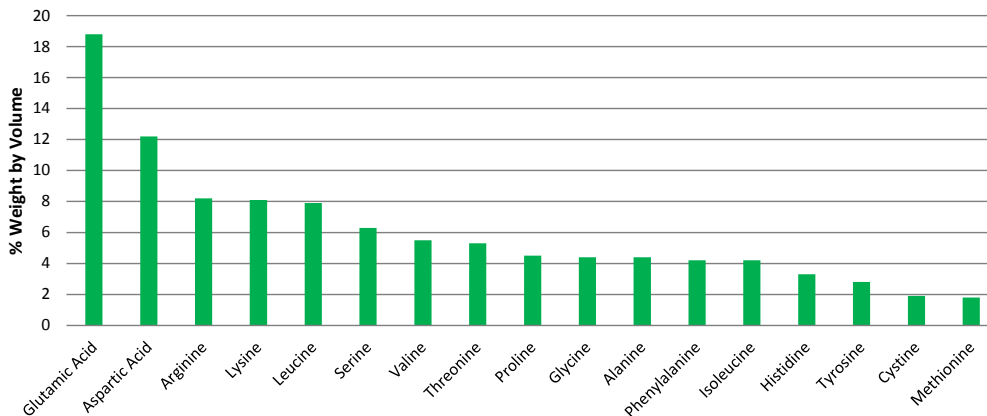


Figure 1. Typical Amino Acid Composition.

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 extraordinary 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.

## ORAC Assay

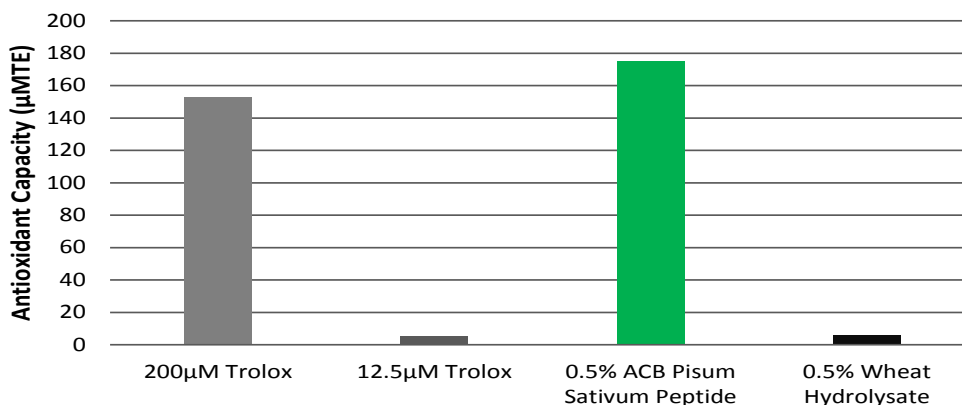


Figure 2. Antioxidant capability.

# ACB Pisum Sativum Peptide

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**.

# ACB Pisum Sativum Peptide

## Effects on Hair Diameter

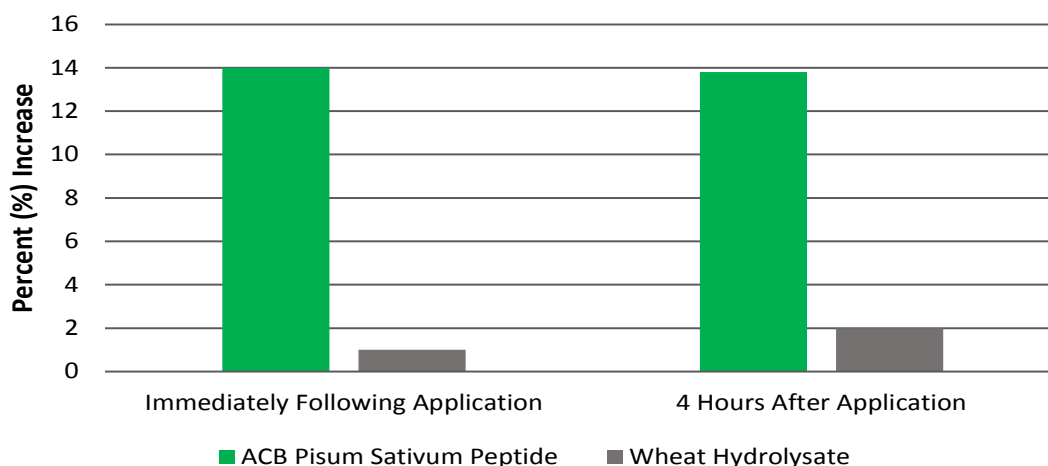


Figure 7. Increase in hair diameter following the initial and +4 hours application of **ACB Pisum Sativum Peptide** and Hydrolyzed Wheat Protein.

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 volunteer's hair was photographed. The images of the half head study were used in conjunction with a sensory study to assess the shine, volume, dry and wet combability, thickness, smoothness, hydration, softness and manageability before treatment, after shampoo treatment and blow dry, and again after conditioner treatment and blow dry. Based on the results obtained, **ACB Pisum Sativum Peptide** is capable of enhancing the volume and overall health of the hair perfect for use in anti-aging hair care product lines.

## Assessment of Hair Characteristics

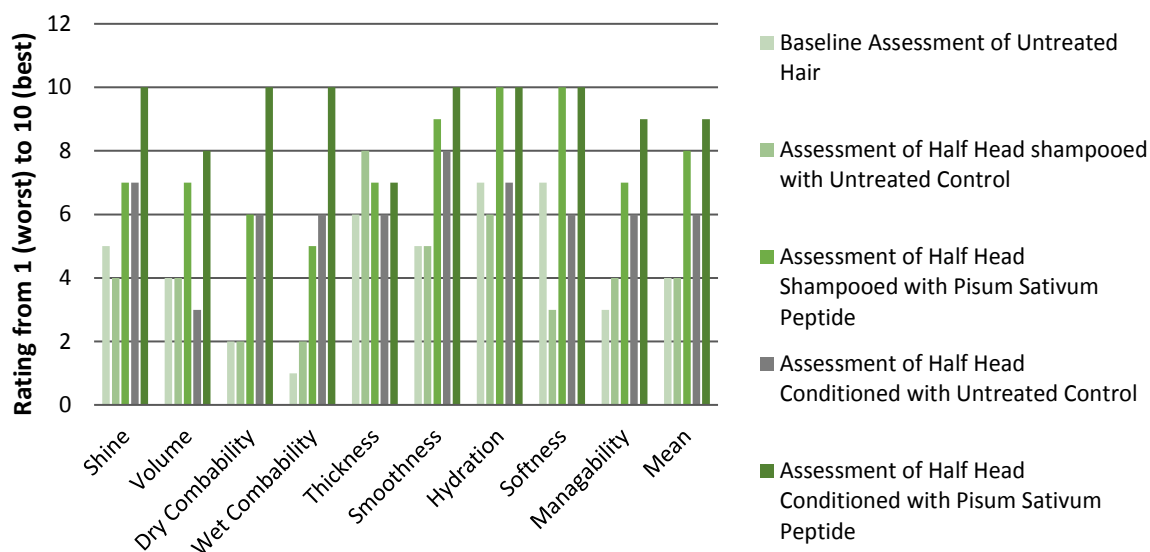


Figure 8. Rating of hair characteristics following sensory assessment.



# ACB Pisum Sativum Peptide



Figure 9. Full head Baseline, Untreated Hair.

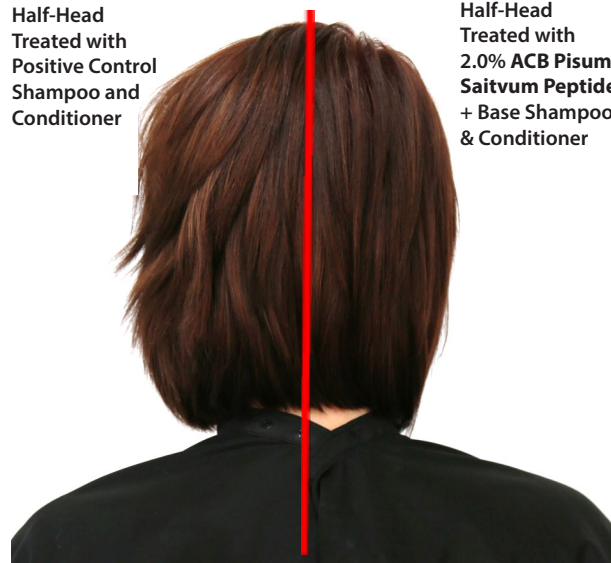


Figure 10. Half-Head Treated.



Figure 11. Full head Baseline, Untreated Hair.



Figure 12. Half-Head Treated.

Increased hydration of the hair is a key benefit of hydrolyzed proteins. As evidenced in an *in-vivo* study, ten (M/F) subjects between the ages of 24 and 37 were instructed to apply either an untreated control, a solution containing 5.0% **ACB Pisum Sativum Peptide**, or a 5.0% solution containing Wheat Hydrolysate to their hair as a leave-in conditioner, once a day for a week. The results demonstrated a comparable increase in hair hydration on subjects using both a 5.0% solution of **ACB Pisum Sativum Peptide** and a 5.0% solution of Wheat Hydrolysate.

# ACB Pisum Sativum Peptide

## Increase in Hair Hydration

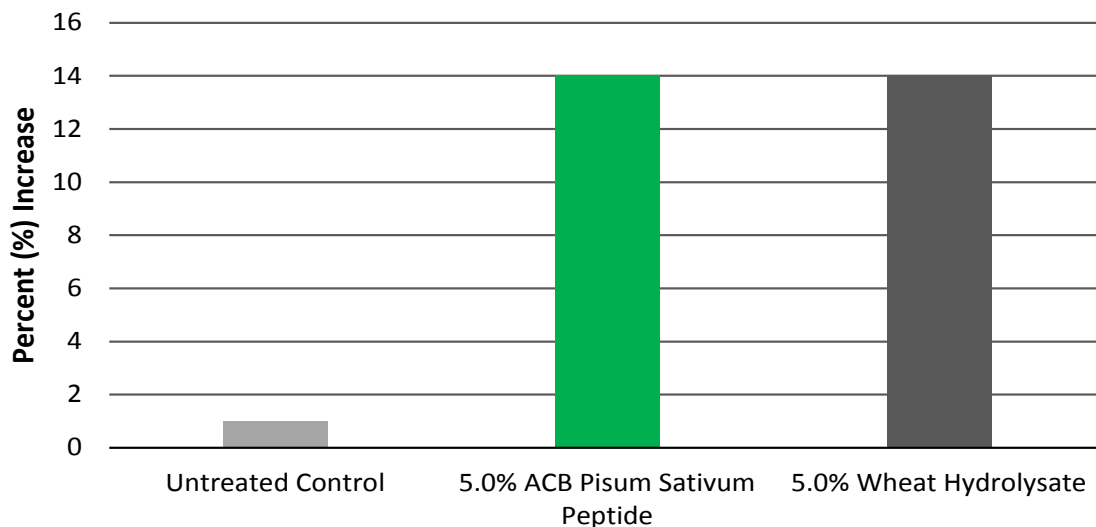


Figure 13. Improvements in Hair Hydration.

**ACB Pisum Sativum Peptide** is active at a cellular level, improving the molecular makeup of hair and skin. As shown in Figure 14, **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

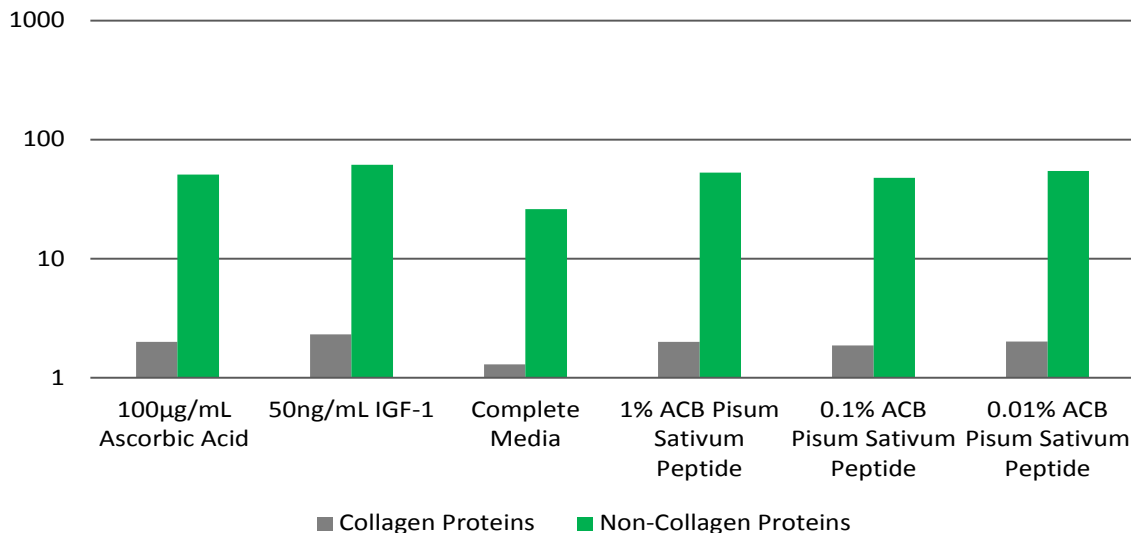


Figure 14. Sirius Red Fast Green Assay.

# ACB Pisum Sativum Peptide

## Cellular Viability

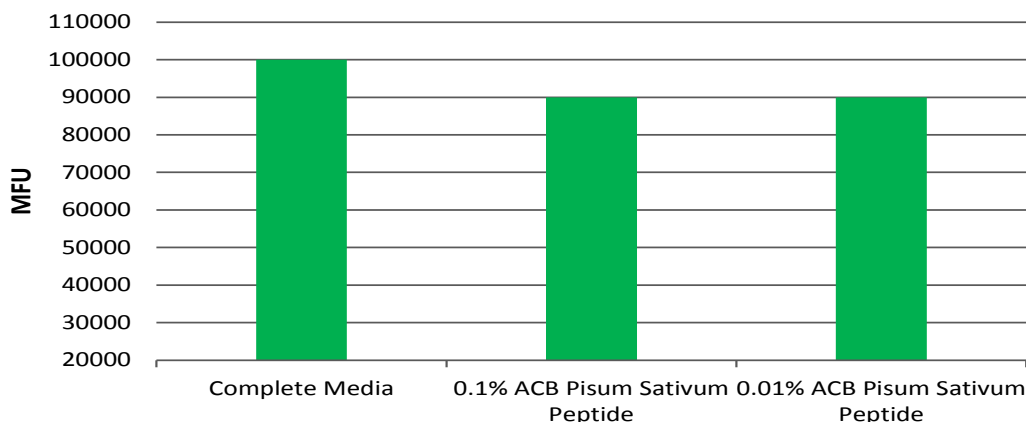


Figure 15. Cellular Viability Assay

In dealing with cellular activity it is important to note any harm or changes occurring 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

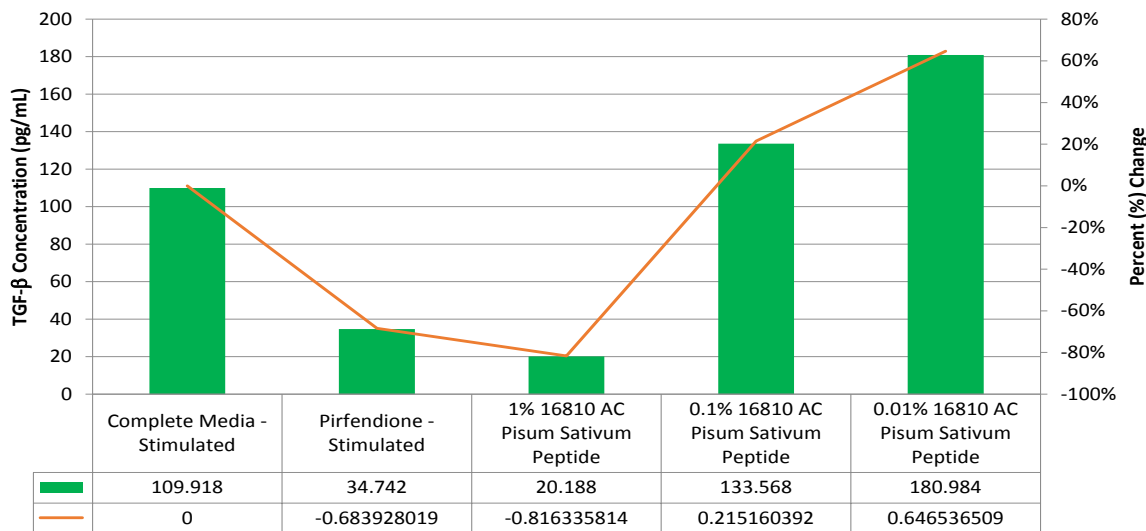


Figure 16. TGF-Beta expression.

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.