

# coreTXpep™

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## Keraplast

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[keraplast.com](http://keraplast.com)

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# Keratin is a natural wonder.

Keratin proteins are the building blocks of life and are vital to the biology and physiology of every animal on our planet.

Keratin is the key structural material making up hair, wool, feather, nails, horns and the outer layer of skin. It protects the surfaces of internal organs from damage or stress, and it is one of the toughest biological materials in the world.

Keratins play a physical role in maintaining cell structure as well as a biological role helping cells make a range of essential proteins for healthy skin structure.

Chinese herbalists have known about the beneficial properties of keratin for over 500 years, using a substance made from the ground ash of human hair to heal wounds and clot blood. But it wasn't until the 1930s that scientists demonstrated that there are actually many different types of keratin, with different molecular weights and different properties.

At Keraplast, we unlock the power of keratin proteins from regeneratively grown wool so that these can be redeployed as beneficial bioactive ingredients. Our proprietary Functional Keratin® technology platform has evolved from decades of scientific research, including over 20 years of fundamental and applied keratin science. We have the technological capability to accurately and skillfully recover a range of specific keratin proteins, with specific molecular weights, that have specific beneficial properties.

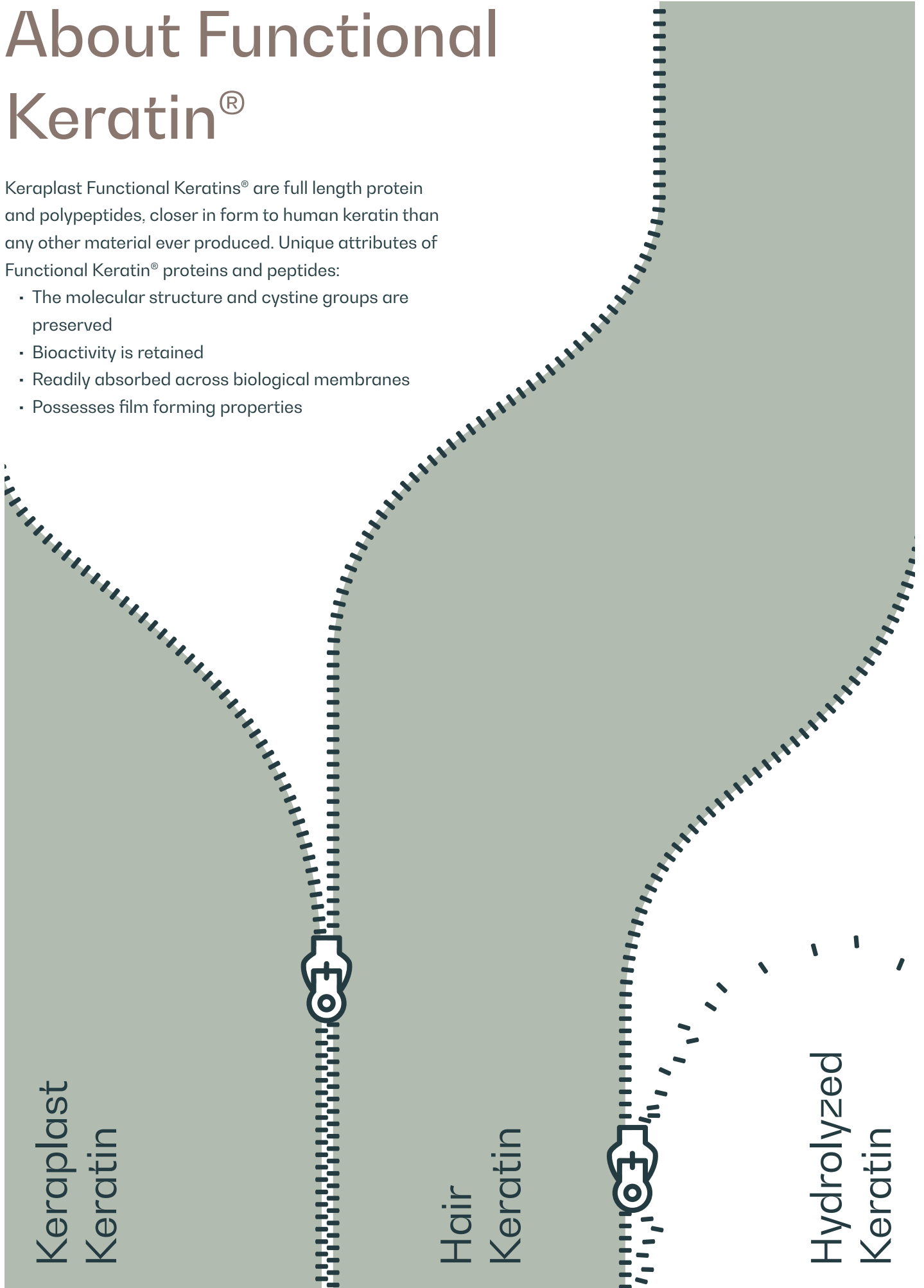
We are world experts in bioactive keratin recovery and formulation.



# About Functional Keratin®

Keraplast Functional Keratins® are full length protein and polypeptides, closer in form to human keratin than any other material ever produced. Unique attributes of Functional Keratin® proteins and peptides:

- The molecular structure and cystine groups are preserved
- Bioactivity is retained
- Readily absorbed across biological membranes
- Possesses film forming properties



Keraplast  
Keratin

Hair  
Keratin

Hydrolyzed  
Keratin



# How Functional Keratin<sup>®</sup> Works

## Functional Keratin<sup>®</sup> has high cystine content

- Strong homology with human keratin, a core component of skin
- Maintains structure of hair, nails and skin
- Repairs damage

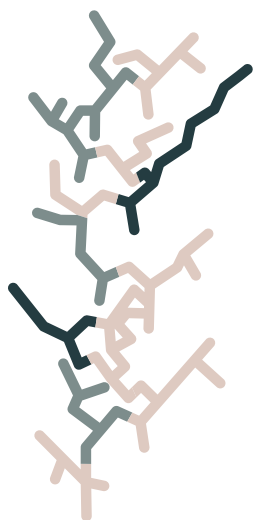
## Functional Keratin<sup>®</sup> has specific amino acid sequences binding to hair strongly

- Similar to a zip structure
- Electrostatic bonding
- Hydrophilic and hydrophobic bonding

## Superior to poorly functioning hydrolyzed keratin in the market Molecular Weight 1,000 Da (Peptide) to 60,000 Da (Film Former)

- Biological activity well established
- Anti-aging, anti-pollution activity well established
- Collagen production demonstrated
- Protects and controls the amino acid cystine

Functional Keratin

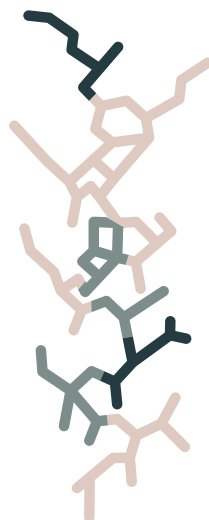


+ve to -ve

hydrophobic

+ve to  $\delta$ -ve

Hair Keratin

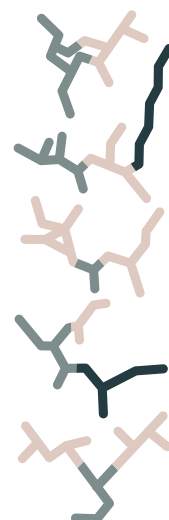


+ve to -ve  
disrupted

weakened  
hydrophobic

+ve to  $\delta$ -ve  
disrupted

Hydrolyzed Keratin







# Functional Keratin® Vs Hydrolyzed Keratin Fragments

	Functional Keratin®	INCI Hydrolyzed Keratins
Functional Protein	Y	N
Proprietary amino acid sequences matched to skin structure	Y	N
Full length protein and peptides that form a sacrificial shield to prevent skin damage	Y	N
Stimulates mTOR pathway within cells, increasing synthesis of structural proteins	Y	N
Reduces redness associated with inflammation of sensitive skin	Y	N
Contains highly potent anti-oxidants to protect against pollutants and UV induced free radical damage	Y	N
Data showing quantitative and qualitative improvements in hair and skin	Y	N
Guaranteed sourced from pure NZ Wool, no harm to animals	Y	N
Patent protected	Y	N



# Finding epic performance in haircare without sacrificing the bottom line

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Performance & provenance. A complete focus on transparency in the provenance of products.

Every ounce of product shipped from our factories is able to be traced back to the source.

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# Ethical to the core

Why is coreTXpep™ an amazing everyday repair ingredient? Because of the availability of sulfur in the form of cysteine.

By keeping the protein intact, there are various mechanisms that will allow connection between the peptide and human hair the secret to the manufacturing process is that the protein is cleaved for solubility then the broken disulfide bonds retain reactive capabilities.

This gives stability in solution while maintaining solubility. Crucially, this cleavage process is reversible meaning that broken disulfide bonds in the hair can react with cortex peptide to permanently bind it into the hair's structure.



# Carbon Efficient

New Zealand has the most carbon efficient production of wool in the world. Better for you, better for the planet.

## The power of natural

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This peptide gets into the cortex of the hair and bonds with broken disulfide bonds creating healthier hair with less breakage, more flex and better feel.

Where other ingredients leave hair fundamentally weakened, coreTXpep™ repairs inside the hair shaft to penetrate, reduce porosity and rebuild bonds.

Salon treatments might work inside the shaft but require heat or chemical modification. coreTXpep™ works without additional heat or chemical treatment meeting the market demand for salon quality hair repair daily.

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# Daily Repair Solution

Most salon repair treatments require heat to be at their most effective. But this heat is difficult to replicate at home. Not everyone has the equipment, the skill, or the will for heat repair at home.

- coreTXpep™ does not require heat to be activated. It can be used as a treatment – we have even proved it as a naturalizer for perming treatments
- Highly effective in everyday uses. A spray after straightening, in a shampoo and conditioner, perhaps in a masque.

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# 1

Contains peptides found in hair cortex, able to penetrate hair to bind & repair.

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# 2

Improve mechanical characteristics, moisturization and aesthetic.

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# 3

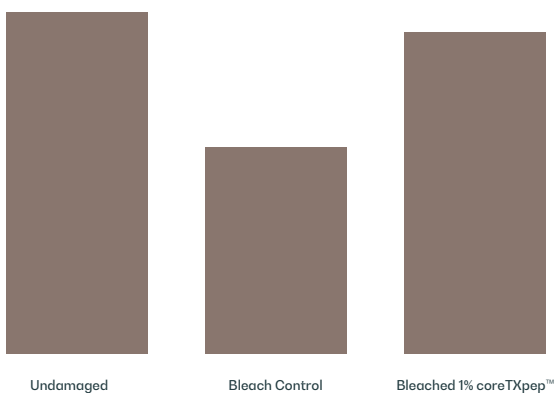
For large orders, we facilitate a direct relationship with the farm and farmer.





# Epic Results. Virtuous Supply Chain. Priced for Everyone.

Highest Force (gF)



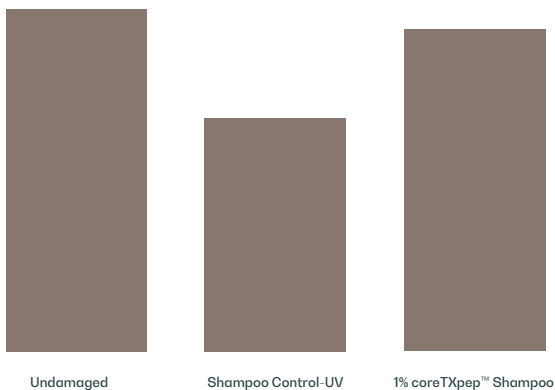
## 20%

Improvement  
in strength of  
bleached hair

Tensile properties of bleached hair tested with single fibre tensile testing. Given 10 aqueous washes with or without coreTXpep™.

- 56% Increase in strength over bleached tresses
- 44% Increase in total energy

Total Energy (mJ)



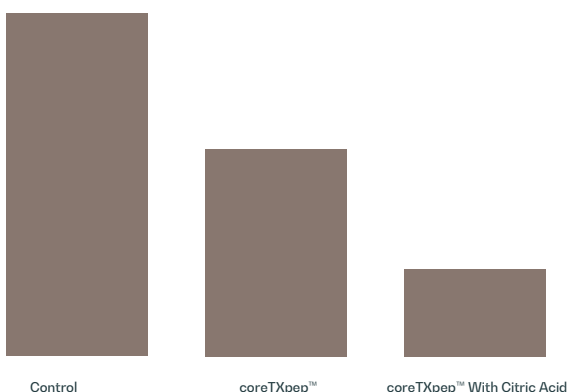
## 38%

Improvement in  
UV exposed hair

Tesile testing was performed on hair exposed to 60 hours of harsh New Zealand sunshine, washed with coreTXpep™ then exposed to a further 78 hours of natural UV.

- 33% Improvement in extension & flexibility
- Improved sensorial proerpties

Number of Broken Fibres



## 75%

Reduction in  
breakage when  
used as a neutralizer

Applied as post-neutralizer step instead of hydrogen peroxide. Post-treatment with citric acid. Subjected to 10 washes & combed dry.

- Improved hair fiber integrity
- Permanent bonding to hair cortex
- Curl retention properties

# About Keraplast

Keraplast is a world-leading biotechnology company. We recover bioactive keratin proteins from regeneratively farmed New Zealand wool and blend these bioactive proteins together to create unique, branded ingredients that are used in the world's leading beauty and personal care products.

We approach the future curiously, pushing ourselves forward whilst contributing to something larger than ourselves. Something that truly matters. Enhancing the future of food and wellness.

We have a long-term vision to be a regenerative business, giving back more than we take. Our ambition is to propel the company beyond sustainability and into regeneration: shifting from a business that “does less harm” into a business that “does more good”.

We know that this will be hard, but we also know that this is right. We are up for the challenge





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# Keraplast

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