



KERACTIVE

A biostimulation treatment for hair follicles



KERACTIVE : qualitative composition

Active Ingredients	Minerals
L-Cysteine•HCl•H ₂ O	Ammonium Metavanadate
L-3,4- Dihydroxyphenylalanine (L -DOPA)	Ammonium Molybdate•4H ₂ O
L-Methionine	Calcium Chloride•2H ₂ O
4-(1-Pyrrolidinyl)-1-(2,4,6-trimethoxyphenyl)-1-butanone (PTMBP)	Cupric Sulfate•5H ₂ O
L-Tyrosine•2Na•2H ₂ O	Ferrous Sulfate•7H ₂ O
Vitamin B1 (Thiamine)	Magnesium Sulfate
Vitamin B3 (Niacinamide)	Manganese Sulfate
Vitamin B5 (D-Pantothenic Acid•½Ca)	Nickel Chloride•6H ₂ O
Vitamin B6 (Pyridoxine•HCl)	Potassium Chloride
Vitamin B8 (D-Biotin)	Sodium Phosphate Dibasic
Vitamin P	Sodium Chloride
Zinc Sulfate•7H ₂ O	Sodium Metasilicate
	Sodium Selenite (0.003 mg/l)
	Zinc Sulfate•7H ₂ O
Amino Acids	Vitamins
L-Alanine	Choline Chloride
L-Arginine•HCl	Cobalamine (Vitamin B12)
L-Asparagine•H ₂ O	Folic Acid•Ca
L-Aspartic Acid	Myo-Inositol
L-Glutamic Acid	Riboflavin
L-Glutamine	
Glycine	Other components
L-Histidine•HCl•H ₂ O	Adenine•HCl
L-Isoleucine	Benzyl Alcohol
L-Leucine	D-Glucose
L-Lysine•HCl	Phenol Red•Na
L-Phenylalanine (16.4 mg/l)	Procaine (0.5 mg/ml)
L-Proline	Putresine•2HCl
Pyruvic acid	Safranin O
L-Serine	D-L-6,8-Thiolic Acid
L-Threonine	Thymidine
L-Tryptophan	
L-Valine	



KERACTIVE
 KER1: 4 vials of 5.0 ml
 KER2: 12 vials of 5.0 ml



Lifford Hall, Lifford Lane, Kings Norton, Birmingham B30 3JN
activecosmetics.com

KERACTIVE is a medium rich in vitamins, amino acids and minerals, formulated to restore effective micro-circulation of the scalp and revitalize hair follicles.

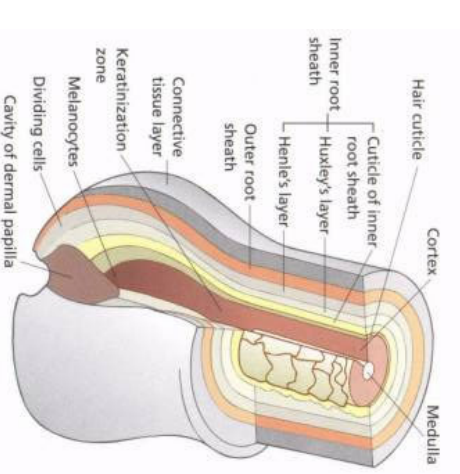
BIOLOGICAL STRUCTURE OF HAIR

Hair is extremely complex, consisting morphologically of several different cells and chemical species.

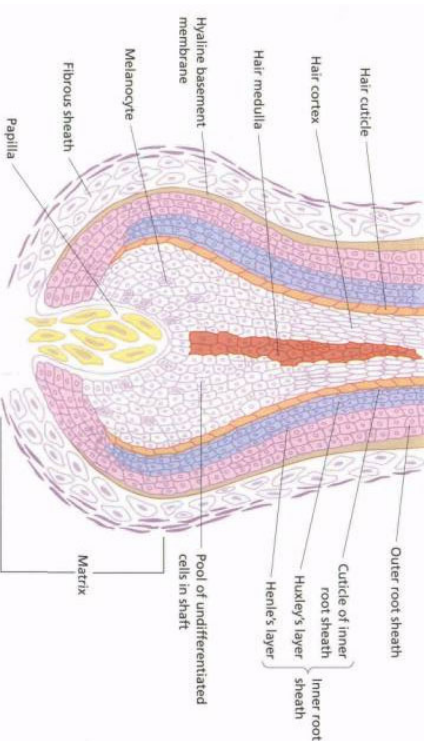
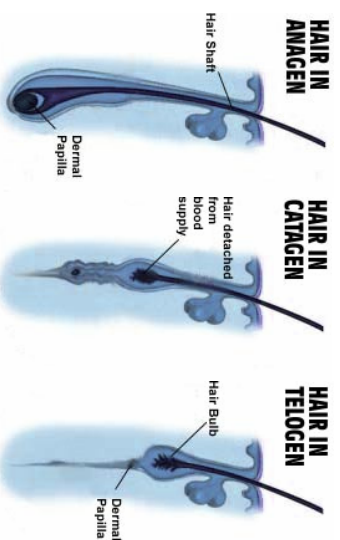
The hair root lies below the surface of the skin enclosed within a hair follicle which is in turn entirely encased in connective tissue and acts as the hair producing unit. The core of any hair follicle is the hair fiber, composed of three different types of epithelial cells: medullary, cortical and cuticular. The medulla, or innermost layer, is only present in large thick hair. The middle layer, or cortex, determines the strength, color and texture of the hair thanks to the presence of melanin and keratin. Finally the outermost layer of the hair fiber is the cuticle, which is thin and colorless and serves to protect the cortex.

The Inner Root Sheath (IRS) surrounding the hair fiber is composed of three cell types: the inner root sheath cuticle, Huxley's layer, and Henle's layer. This IRS is surrounded by another cellular envelope known as the Outer Root Sheath (ORS), composed of two cellular structures. One is called the companion layer, and the other consists of ORS cells.

These cells are in contact with the dermal papilla situated at the base of the hair follicle. This directs and dictates the embryonic generation of a hair follicle thanks to cells shown to be capable of inducing follicle development from the epidermis and producing the hair fiber. The dermal papilla is fed by the bloodstream, which carries nutrients to produce new hair, and plays an essential role in the induction and maintenance of hair growth.



Under normal circumstances, hair growth in each hair follicle follows a cycle consisting of three main stages: anagen (growing phase), catagen (transition or rapid involution phase) and telogen (resting phase).



Normally, this cycle of hair production and inactivity will continue for the duration of the individual's life. Other factors can, however, influence and inhibit hair production by aberrant hair follicle cycling and changes in the hair follicle morphology, leading in some cases to the physical destruction of the hair follicle. Pattern baldness or androgenic alopecia is the result of genetic programming for permanent hair loss, whereas increased hair shedding, or temporary hair loss, can have many different causes: poor nutrition and diet, hormones, age, medication, infections, stress, use of chemicals, rapid weight loss, illnesses, disease, hair-care practices, etc.

PROPERTIES

KERACTIVE reaches the hair at its root and in particular at the dermal papilla which is vital for the development of hair follicles. The formulation of **KERACTIVE** has been designed to stimulate new hair growth by rejuvenating damaged hair follicles and to create a healthy environment for new hair to grow.

Under the influence of the dermal papilla, differentiation of the epidermal cells during the anagen stage produces a hair fiber and associated products. Insufficient dermal papilla cell stimulation results in a stoppage of the growth of the hair fiber and root sheaths. The dermal papilla can become isolated in the dermis and the hair fiber can easily be easily pulled out leading to hair loss.

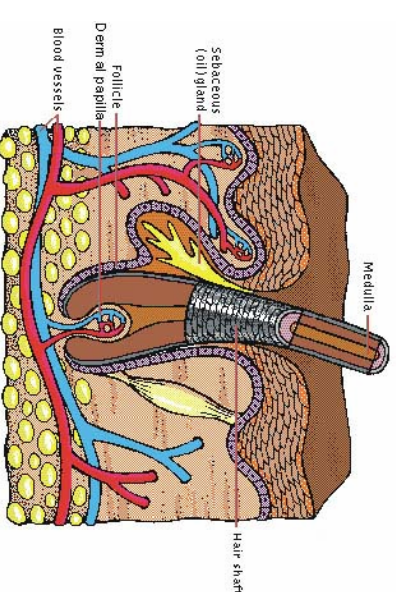
KERACTIVE slows down this process by providing the dermal papilla with the nutritional elements required for hair growth.

The primary component of hair fiber is keratin protein, a long chain of amino acids (Table 1) that forms the cytoskeleton of all epidermal cells. Research has evidenced that the durability and resistance of hair fiber to degradation under environmental stress stem from the high amount of sulfur which comes from the amino acid, cysteine, in the hair fiber. The sulfur in the cysteine molecules in adjacent keratin proteins binds to form disulfide chemical bonds which are very strong and very difficult to break apart. **KERACTIVE**, by ensuring a permanent bio-availability and a proper ratio of all the amino-acids present in healthy hair, optimizes the production of keratin proteins.

Table 1: Table of the amino acids present in normal human hair in order of their quantity

Amino Acid	Amount in residues extracted (%)
Cysteine	20
Serine	13
Glutamic acid	13
Threonine	8
Glycine	7
Leucine	7
Valine	7
Arginine	6
Aspartic acid	5
Alanine	5
Isoleucine	3
Tyrosine	2
Phenylalanine	2
Histidine	1
Methionine	1

The cells in hair follicles produce all the keratin they require from the nutrients supplied by the blood vessels of the dermal papilla. Any reduction in the blood and oxygen supply to the scalp results in increased hair shedding, damaged hair and slow regrowth.



It is therefore essential to restore an efficient micro-circulation in order to enhance or re-establish the phenomena of tissue exchange which ensures good dermal papilla function. Thanks to the vasodilator activity of the PTMBP (4-(1-Pyrrolidinyl)-1-(2,4,6-trimethoxyphenyl)-1-butanone), **KERACTIVE** helps to increase blood flow and therefore to irrigate and oxygenate the scalp. It restores an efficient functional micro-circulation by opening the spasmed pre-capillary sphincters at the expense of the arteriovenous shunts. Derivatives of the flavonoides such as rutin offer a particularly beneficial vasculo-protective effect in that respect. They increase the resistance of the capillaries directly by stabilizing the vascular basal membrane and indirectly by increasing the uptake of free radicals.

Bibliography

Bergfeld WF. Alopecia: histologic changes. *Adv Dermatol.* 1989;4:301-20;discussion 321. • Bulley JA, Messenger AG, Taylor M, Ashcroft AT, Westgate GE, MacNeil S. *Extracellular matrix derived from hair and skin fibroblasts stimulates human skin melanocyte tyrosinase activity.* *Br J Dermatol.* 1994 Dec;131(6):836-42. • Budde J, Tronnier H, Rahls VW, Frei-Klemer S. *Systemic therapy of diffuse effluvium and hair structure damage.* *Hautartz.* 1993 Jun;44(6):380-4. • Costarelli G, Millar SE. *Towards a molecular understanding of hair loss and its treatment.* *Trends Mol Med.* 2001 Jul;7(7):293-301. • Courtois M, Loussouarn G, Hourseau C, Grullier JF. *Hair cycle and alopecia.* *Skin Pharmacol.* 1994;7(1-2):84-9. • Di Buono M, Wykes LJ, Cole DE, Ball RO, Pencharz PB. *Regulation of sulfur amino acid metabolism in men in response to changes in sulfur amino acid intakes.* *J Nutr.* 2003 Mar;133(3):733-9. • Emerit I, Filipe P, Freitas J, Vassey J. *Protective effect of superoxide dismutase against hair greying in a mouse model.* *Photochem Photobiol.* 2004 Jun 1. • Fratini A, Powell BC, Hynd PJ, Keough RA, Rogers GE. *Dietary cysteine regulates the levels of mRNAs encoding a family of cysteine-rich proteins of wool.* *J Invest Dermatol.* 1994 Feb;102(2):178-85. • Fratini A, Powell BC, Rogers GE. *Sequence, expression, and evolutionary conservation of a gene encoding a glycine / tyrosine-rich keratin-associated protein of hair.* *J Biol Chem.* 1993 Feb 25;268(6):4511-8. • Hincbe T. *Structure and function of melanocytes: microscopic morphology and cell biology of mouse melanocytes in the epidermis and hair follicle.* *Histol Histopathol.* 1995 Jan;10(1):223-37. • Liu SM, Maia G, Figliomeno S, Powell BC, Nesci A, Masters DG. *Transsulfuration, protein synthesis rate and follicle mRNA in the skin of young Merino lambs in response to infusions of methionine and serine.* *Br J Nutr.* 2000 Apr;83(4):401-9. • Mackinnon PJ, Powell BC, Rogers GE. *Structure and expression of genes for a class of cysteine-rich proteins of the cuticle layers of differentiating wool and hair follicles.* *J Cell Biol.* 1990 Dec;111(6 Pt 1):2587-600. • Maulden T, Rosenfield RL, Shuler CF, Schwartz SA. *Studies of androgen metabolism and action in cultured hair and skin cells.* *J Steroid Biochem.* 1988 May;24(5):1053-60. • Mullinari-Brenner F, Bergfeld WF. *Hair loss: an overview.* *Dermatol Nurs.* 2001 Aug;13(4):269-72;277-8. • Powell BC, Nesci A, Rogers GE. *Regulation of keratin gene expression in hair follicle differentiation.* *Ann N Y Acad Sci.* 1991 Dec 26;642:1-20. • Powell BC, Rogers GE. *The role of keratin proteins and their genes in the growth, structure and properties of hair.* *J Anim Sci.* 1997;78:59-148. • Reis PJ, Sahu T. *The nutritional control of the growth and properties of mohair and wool fibers: a comparative review.* *J Anim Sci.* 1994 Jul;72(7):1899-907. • Rogers GE. *Hair follicle differentiation and regulation.* *Int J Dev Biol.* 2004;48(2-3):163-170. • Shapiro J, Wiseman M, Lui H. *Practical management of hair loss.* *Can Fam Physician.* 2000 Jul;46:1469-77. • Springer K, Brown M, Stulberg DL. *Common hair loss disorders.* *Am Fam Physician.* 2003 Jul 1;68(1):93-102. • Stern K.S., Paus R. *Controls of hair follicle cycling.* *Physiological Review.* Jan 2001;81(1):449-494. • Sulaimon SA, Kitchell BE. *The biology of melanocytes.* *Vet Dermatol.* 2003 Apr;14(2):57-65. • Thielke CC. *Alopecia in women.* *Am Fam Physician.* 2003 March 1;67(5):1007-14. • Tomita Y, Seiji M. *Inactivation mechanism of tyrosinase in mouse melanoma.* *J Dermatol.* 1977 Dec;4(6):245-9. • Van Neste D, Tobin DJ. *Hair cycle and hair pigmentation: dynamic interactions and changes associated with aging.* *Micron.* 2004;35(3):193-200. • White CL, Martin GB, Hynd PJ, Chapman RE. *The effect of zinc deficiency on wool growth and skin and wool follicle histology of male Merino lambs.* *Br J Nutr.* 1994 Mar;71(3):425-35.

KERACTIVE also contains all the metabolites (vitamins and minerals) required for proper functioning of the nutritional and energetic metabolism. **KERACTIVE** is particularly rich in vitamin B which (especially when combined with zinc) prevents hair shedding and regulates sebum secretion and dandruff caused by the build up of cellular debris which asphyxiates the hair follicles. Graying is also attenuated by Vitamin B and by DOPA, a melanin precursor.

Minerals (zinc, selenium, copper, manganese) known for their anti-oxidant properties and their role in enzymatic reactions leading to hair growth and repair are also brought by **KERACTIVE**.

INDICATIONS

KERACTIVE is particularly recommended:

- To treat non-androgenic alopecia.
- To repair hair prematurely damaged by environmental aggressions (sun, pollution, diet, medication, etc...).
- To stimulate hair growth and health.
- To treat female hair loss.
- To eliminate dandruff and seborrhea.
- To create a healthy environment for hair transplants.
- To treat thin and/or devitalized hair.