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AC

Det'Ox Hair

Heavy Metal Protection

Antioxidant

Hair Strength



VEGAN



SEPHORA
CLEAN



CREDO
CLEAN



COSMOS
COMPLIANT



ISO 16128



PRODUCT
PASSPORT



THE FEATURES.

To address the growing demand for natural ingredients capable of combating global warming and the increasing presence of heavy metals in the environment, body, and hair, AC Det'Ox Hair offers a natural and effective solution. This ingredient helps counteract the harmful effects of heavy metals by preventing their accumulation on the hair and facilitating their removal. As a result, it enhances hair strength and resilience. Its formula combines the fermentation of *Saccharomyces cerevisiae*—which naturally produces alpha-lipoic acid (ALA)—with kale extract, a rich source of the same powerful antioxidant and of ascorbic acid (vitamin C). Yeast fermentation improves the bioavailability of natural ALA, while kale-derived vitamin C further enhances the active's detoxifying action.

*INCI: Saccharomyces/Brassica Oleracea
Acephala Leaf Ferment Filtrate &
Lactobacillus Ferment Lysate*

TECHNICAL DATA SHEET.

THE STORY.

Around 17% of global croplands are contaminated with heavy metals, a problem exacerbated by climate change and melting glaciers, which release these metals into the environment.¹ Humans are exposed to heavy metals primarily through water, food, and air pollution; furthermore, the water consumers use to wash their hair can even contain traces of lead, copper, iron, cadmium, or nickel. To address this, sustainable remediation methods have emerged. Phytoremediation, for example, leverages certain plants to absorb and neutralize contaminants. Kale has shown particular promise due to its strong antioxidant defense system, making it effective in soils polluted with lead and cadmium.² Another innovative approach is biosorption, which removes metals by binding them to biological materials; researchers have developed yeast-based hydrogels capable of filtering contaminated water efficiently. Such technologies are crucial, as heavy metals not only contaminate the environment but also affect the human body in various ways. For instance, they can significantly impact hair health. They can accumulate on hair fibers, causing dullness, dryness, breakage, and color fading. Minerals from hard water, such as calcium and magnesium, weaken keratin bonds, while metals like copper trigger oxidative damage. Prolonged exposure can disrupt hair growth cycles, leading to conditions such as telogen effluvium.³ Natural chelating and antioxidant ingredients in hair care products can help neutralize metal ions, protect keratin integrity, and improve color stability and shine. This growing awareness of environmental stressors and metal exposure is fueling the global anti-pollution hair care market,⁴ as consumers seek solutions to protect their hair from pollution-related damage.



THE SCIENCE.

Whether you're at the salon or preparing to dye your hair at home, your strands are exposed to heavy metals. One important chemical interaction to be aware of is the Fenton reaction, which occurs when hydrogen peroxide reacts with metal ions such as copper or iron, producing highly reactive hydroxyl radicals. During oxidative treatments like bleaching or hair dyeing, hydrogen peroxide can interact with residual metal ions—commonly found in hard water—leading to the generation of these radicals. In hair, this can result in significant damage: keratin bonds may break, weakening the hair's structure; dryness and fragility can develop as the protein network degrades; and hair color may shift toward unwanted shades, such as green or deep yellow, due to metal accumulation. Natural chelating agents offer an effective strategy to inhibit the Fenton reaction. By tightly binding metal ions, chelation renders them chemically inactive, preventing them from catalyzing radical formation. This can lead to reduced oxidative stress, improved color stability, enhanced shine and hydration, and less cuticle damage. Alpha-lipoic acid (ALA) is a powerful antioxidant with both metal-chelating and protective properties. It forms complexes with heavy metals, reducing their capacity to damage proteins and lipids, while also neutralizing free radicals generated by metals. ALA can regenerate other natural antioxidants, such as vitamin C, further protecting keratin and cuticular lipids. In addition, it supports scalp health by reducing local oxidative stress and potentially improving cellular metabolism.⁵ Vitamin C (ascorbic acid) is another potent antioxidant that protects hair from oxidative stress caused by heavy metals. Metals generate reactive oxygen species (ROS) that can compromise hair proteins, lipids, and color. Vitamin C helps reduce ROS levels, safeguarding hair structure, enhancing shine, and minimizing metal-induced dullness. Together, these ingredients chelate metals on the hair shaft and scalp while neutralizing free radicals, offering comprehensive protection for stronger, healthier, and more vibrant hair.

THE TECHNICAL DETAILS.

INCI. Saccharomyces/Brassica Oleracea Acephala

Leaf Ferment Filtrate & Lactobacillus Ferment Lysate

CAS. 8013-01-2 & 68333-16-4 (or) 92128-79-5

EINECS. 232-387-9 & N/A (or) 295-777-8

EUROPE. Contact Us

USA. Compliant

CHINA. Contact Us

Origin. Botanical/Yeast/Bacteria

Natural Antimicrobial. Lactobacillus Ferment Lysate

Preservatives. None

Solvents Used. Water

Appearance. Opaque Liquid, Light Beige to Tan

THE FORMULATION TIPS.

pH Stability. 4 - 7

Temperature Stability. Stable up to 50°C

Use Level. 1 - 5%

Ionic State. Cationic

Alcohol Compatibility. Compatible with up to 1% alcohol at 5% use level

Solubility. Water Dispersible

Pro Tips. It is recommended that this product is added during the cooling phase of the formulation process

AC Det'Ox Hair

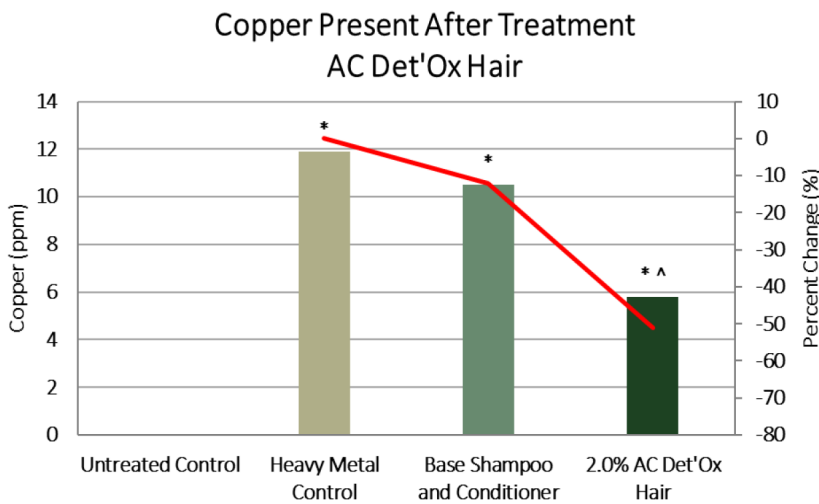
THE BENEFITS OVERVIEW.

Heavy Metal Clarification	ICP Elemental Analysis		Healthier Scalp	Scalp Care Study	
Conditioning Without Buildup	Cationic Substantivity Assay		Hair Shaft Growth	Hair Shaft Elongation Assay	
Environmental Shield	Airborne Pollutant Hair Protection Assay		Long-Lasting Color	Color Protection Assay	
Cellular Integrity	Cellular Detoxification Assay		Hair Fiber Integrity	Tensile Strength	
Fighting Free Radicals	ROS Assay – Antimycin A		Cellular Vitality	SA-beta-gal Activity	
Metal Stress Shield	ROS Assay – Heavy Metals		Fighting Pollution	Air-borne Pollution Protection	
			Stylist Approved	Salon Half-Head Study	

THE EFFICACY.

Heavy Metal Clarification

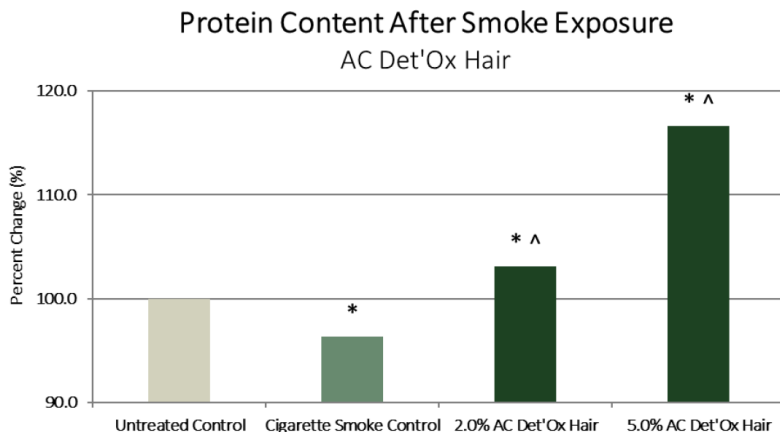
Three human virgin hair tresses were collected and soaked for thirty minutes in a metal solution containing 13 ppm copper. After soaking, one tress was rinsed with water as the Heavy Metal Control, one was washed with base shampoo and conditioner, and one was washed with base shampoo and conditioner containing 2.0% AC Det'Ox Hair. All three tresses were hung to air dry completely. A fourth tress was left as an untreated control for baseline copper content.



**Removes
copper deposits
in hair after
one wash by
-51%**

Environmental Shield

This an *ex vivo* study used cigarette smoke as a model for PM 2.5 exposure—an airborne pollutant known to penetrate and oxidize hair fibers. Human brunette hair tresses were treated with water, 2.0% or 5.0% AC Det'Ox Hair, or left untreated, then exposed to controlled cigarette smoke conditions. Tryptophan levels, a marker for protein integrity, were measured via fluorescence; lower fluorescence indicated greater oxidative damage. Results demonstrated that AC Det'Ox Hair significantly preserved tryptophan levels compared to the smoke-only control, suggesting it offers protective benefits against pollution-related hair damage.

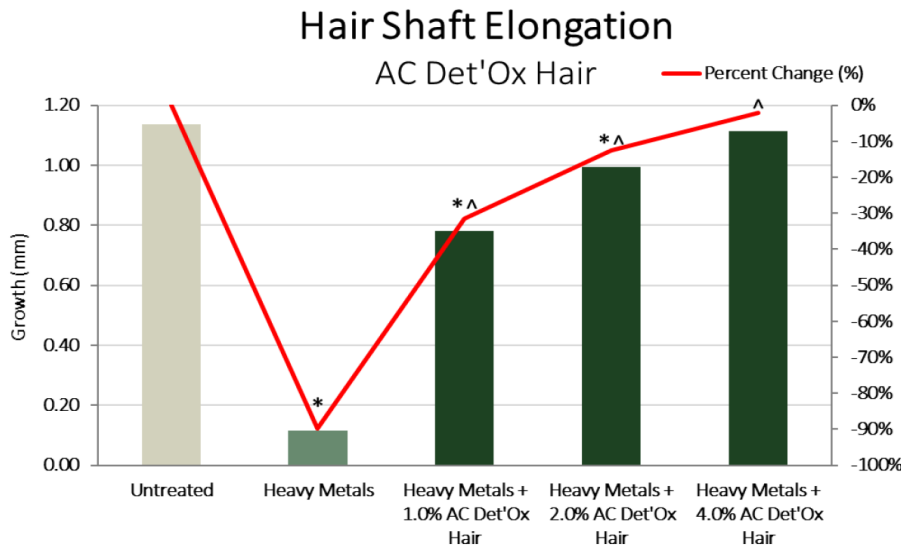


**Retains
+7% more
tryptophan**

THE EFFICACY CONTINUED.

Hair Shaft Growth

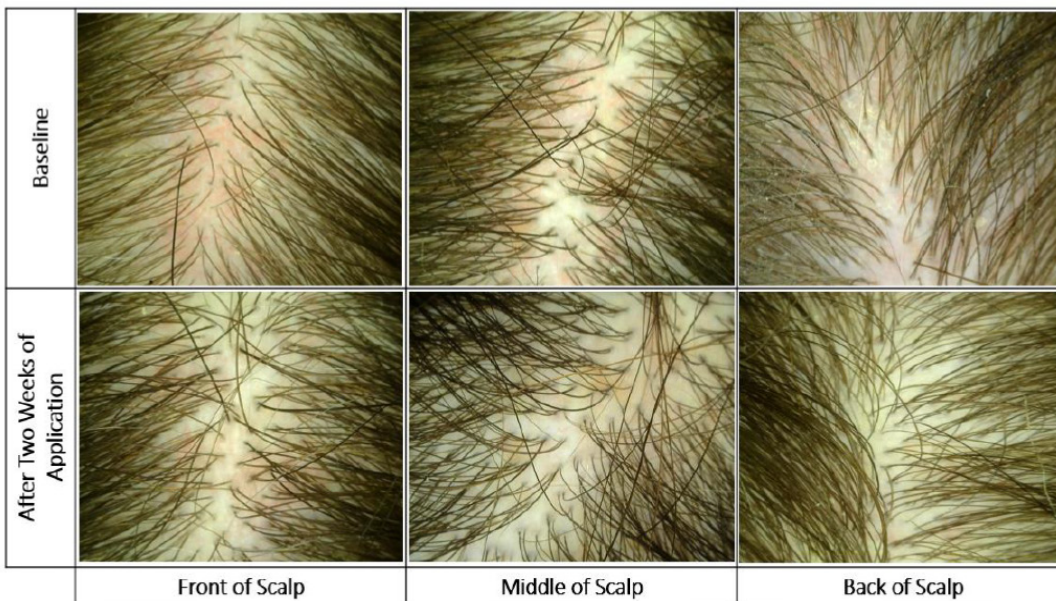
Plucked scalp hair was obtained from five healthy males, aged 18-40. Hair follicles were isolated with watchmaker's forceps, in the anagen phase, and were required to have an intact bulb. Culturing plucked hair follicles is a reproducible and quantifiable ex vivo method to assess hair follicle growth rate that mimics in vivo hair growth. Heavy Metal exposure was utilized as a model to exert deleterious effects on normal hair shaft growth. Hair follicles were placed into the following conditions: complete media (untreated), heavy metals (table 1), or heavy metals + 1.0%, 2.0%, and 4.0% concentrations of AC Det'Ox Hair diluted with complete media.



Supports healthy hair by +87% growth retention

Healthier Scalp

Irritation of the skin and scalp are often associated with increased erythema levels. As a result of erythema on the scalp, consumers may experience a tightening sensation, scalp flakiness, and poor scalp hydration. Accordingly, a Scalp Care Study was conducted to assess the ability of AC Det'Ox Hair to reduce scalp erythema while maintaining moisturization and barrier function. Ten volunteers between the ages of 20 and 63 participated in this study. Participants were blindly treated with either the base shampoo and base conditioner or the test product containing 2.0% AC Det'Ox Hair in the base shampoo and base conditioner.



Reduces erythema levels on the scalp by -3%

AC Det'Ox Hair

THE EFFICACY CONTINUED.

Long-Lasting Color

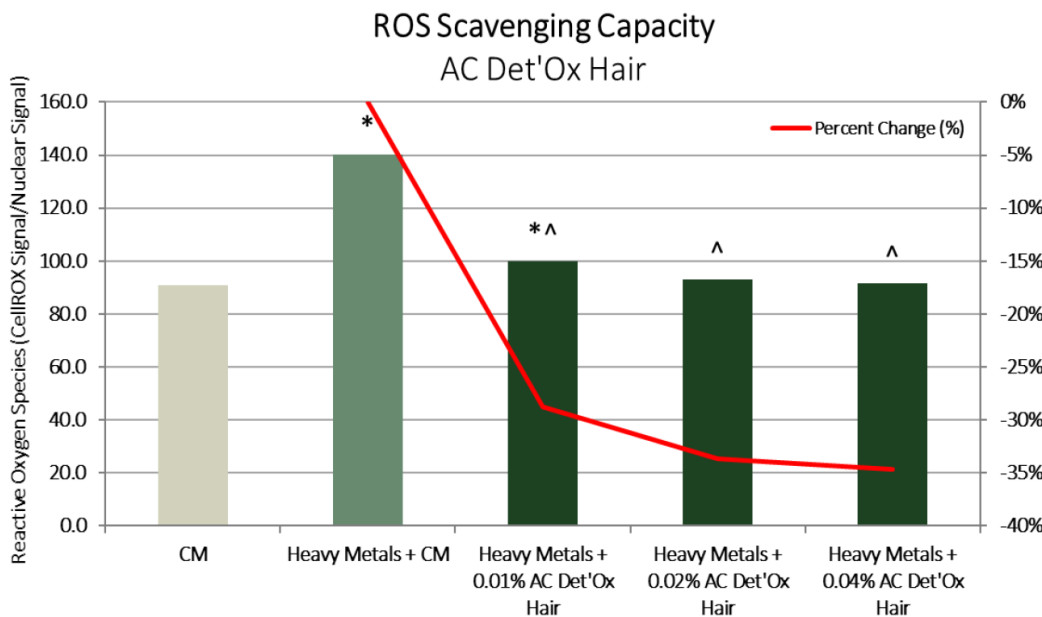
Red-dyed blonde hair tresses were subjected to multiple wash cycles and UV exposure. Tresses were treated with either base shampoo and conditioner, the same base with 2.0% AC Det'Ox Hair, or left untreated. Color intensity (CIELab*) was measured before treatment, after 7 and 14 washes, and following 0, 10, 20, or 30 hours of UV exposure using Xenon-Arc light to simulate sunlight. Microscopy and color analysis revealed that AC Det'Ox Hair-treated tresses retained color more effectively and showed less structural damage.

	UV Exposure Time			
	0 Hours	10 Hours	20 Hours	30 Hours
Untreated Control				
Base Shampoo and Conditioner 7 Wash Cycles				
2.0% AC Det'Ox Hair in Shampoo and Conditioner 7 Wash Cycles				
Base Shampoo and Conditioner 14 Wash Cycles				
2.0% AC Det'Ox Hair in Shampoo and Conditioner 14 Wash Cycles				

Boosts color protection by +24%

Oxidative Stress

A ROS Scavenging Assay was conducted to assess the in vitro effect of AC Det'Ox Hair to scavenge heavy metal-induced oxidative stress in hair follicle dermal papilla cells. Exposure to heavy metals elicits an overproduction of oxidative stress and attenuating this excessive ROS preserves cellular homeostasis and blunts intrinsic and extrinsic age-related declines in skin cell function. Human Hair Follicle Dermal Papilla Cells (HFDPCs) were seeded into a collagen coated 96-well tissue culture microplate and grown to 80%-90% confluency in complete media (CM). 0.01%, 0.02% and 0.04% concentrations of AC Det'Ox Hair in CM with and without the presence of Heavy Metals.



Reduces ROS levels by -34%

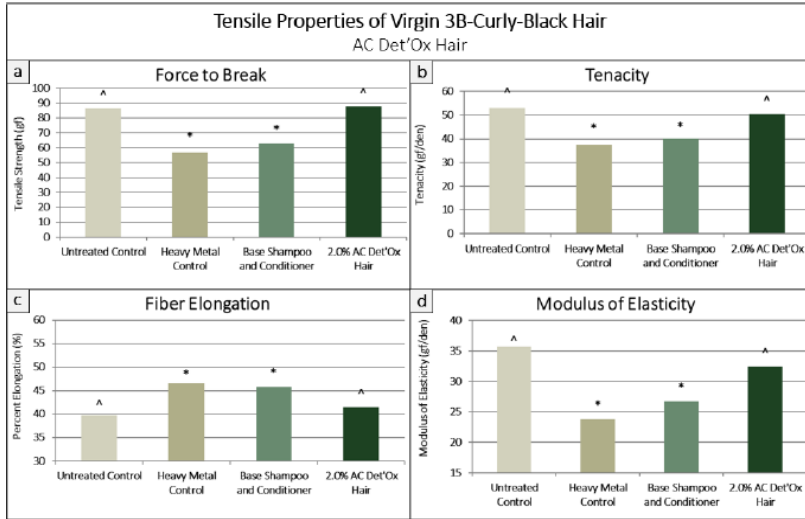
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AC Det'Ox Hair

THE EFFICACY CONTINUED.

Hair Fiber Integrity

An *ex vivo* tensile strength assay was conducted on human hair tresses subjected to 14 repeated wash cycles. Hair types varied across straight, wavy, and curly textures. Tresses were treated with either a base shampoo and conditioner or the same base containing 2.0% AC Det'Ox Hair. After treatment, individual hair fibers were tested using the ASTM D3822 method to evaluate mechanical properties including force to break, tenacity, elongation, and elasticity. Results showed that AC Det'Ox Hair-treated fibers exhibited significantly improved strength and resistance.



Improves force to break by +55%

Stylist Approved

A Salon Half-Head Study was conducted to evaluate the perceived hair benefits of AC Det'Ox Hair in a shampoo and conditioner on wet and dry hair. These results indicate AC Det'Ox Hair improves the perceived benefits with wet and dry hair when added to shampoo and conditioner at recommended use levels. Collectively, AC Det'Ox Hair demonstrates visual and perceived hair characteristics which contribute to a healthier looking hair appearance.



Improves hydration and overall feel by +24%

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