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AC ExoVitalize

DELIVERY SYSTEM



VEGAN



COSMOS



IN VITRO



IN VIVO



CHINA



ISO 16128



PRODUCT
PASSPORT



THE FEATURES.

Active Concepts aims to evolve the modern incarnations of cosmetic delivery systems through the use of BioAuthentic Exosomes. While exosomes currently available in the market are typically sourced from animal or human stem cells, primarily targeting anti-aging benefits, Active Concepts pioneers a natural approach to delivery systems while broadening the spectrum of benefits. Introducing AC ExoVitalize, a natural exosomal delivery system that encapsulates watermelon and grapefruit extract, utilizing their essential amino acid content to enhance the cellular processes of glycolysis and oxidative phosphorylation. Two cellular functions that rapidly increase ATP production, this ingredient allows our skin to wake up on a cellular level.

Water & Citrus Paradisi (Grapefruit) Fruit Extract & Citrullus Lanatus (Watermelon) Fruit Extract & Phospholipids

Actions

**BioAuthentic Exosome
Cellular Energetics
Wake Up Skin
Lifted Appearance**

TECHNICAL DATA SHEET.

THE REGULATION.

INCI. Water & Citrus Paradisi (Grapefruit) Fruit Extract & Citrullus Lanatus (Watermelon) Fruit Extract & Phospholipids
CAS. 7732-18-5 & 8016-20-4 & 90244-99-8 & 123465-35-0 (OR) 8002-43-5
EINECS. 231-791-2 & N/A & 290-802-9 & N/A (OR) 232-307-2
EUROPE. Compliant at Suggested Use Levels
USA. Compliant
CHINA. Compliant

THE SPECIFICATION.

Origin. Botanical & Bacteria
Natural Antimicrobial. Lactobacillus Ferment
Preservatives. None
Solvents Used. Water
Soluble/Miscible. Water Dispersible
Appearance. Liquid Exosomal Dispersion, Light Beige to Tan
Use Level. 1- 10%



THE STORY.

Delivery systems act as the trusted couriers of the beauty world. At the intersection of beauty and science, these vesicles ensure the effective delivery of cosmetic actives to consumers in their personal care products. However, to stay competitive in the ever-changing industry, Active Concepts has evolved modern incarnations of well-known delivery systems. While conventional delivery systems rely on synthetic means, our company proudly champions green chemistry and sustainability. As is our signature approach, we turned to nature for the answer to craft a solution that harmonizes with both the skin and the planet.

Adding to our delivery system technology platform, Active Concepts introduces BioAuthentic Exosomes — natural vesicles that are functionally identical to exosomes, extracted from natural sources, and target specific benefits. AC ExoVitalize is intended to wake up the skin on a cellular level. By encapsulating grapefruit and watermelon extract, this ingredient directly provides our skin with the essential amino acids required to push forward the cellular functions of glycolysis and oxidative phosphorylation. Following the mechanical processing of grapefruit and watermelon, the plant materials are individually extracted with water and dispersed in phospholipids. Once the natural antimicrobial, *Lactobacillus* ferment is added, the solution is homogenized to form exosomes. By encapsulating these botanical extracts into a natural exosomal delivery system, this ingredient enhances the delivery of essential amino acids to push forward glycolysis and oxidative phosphorylation to wake up the skin on a cellular level.

Tired skin often leads to sagging, the onset of the appearance of wrinkles, and dullness. Because glycolysis and oxidative phosphorylation can produce energy, or ATP, quickly, our skin's cells will "wake up" and have a naturally lifted appearance.

THE SCIENCE.

By definition, exosomes are the smallest forms of extracellular vesicles and are natural, membrane-derived particles¹. They are shed by most cells in response to intracellular and extracellular stimuli. With their ability to increase cell-to-cell contact and intracellular communication, exosomes are efficient at enhancing the delivery and bioavailability of actives to intended cells². As an active area of research, exosomes are mainly used in the pharmaceutical space, harnessing their therapeutic and diagnostic potential. Exosomes are emerging in the personal care industry as well, however, they are only being marketed towards skin rejuvenation, anti-aging, and are derived from human or animal stem cells. As Active Concepts realizes most brands are not a one-stop shop, our exosome line provides significant advances in delivery system brand differentiation with natural origins and a plethora of benefits to choose from.

AC ExoVitalize enhances the cellular processes of glycolysis and oxidative phosphorylation. Glycolysis is a metabolic pathway that occurs in the cytosol of cells and is an anaerobic energy source that oxidizes glucose molecules, the most crucial organic fuel in animals, plants, and microbes³. In anaerobic conditions, pyruvate converts to lactate, resulting in the production of two adenosine triphosphate (ATP) molecules. This process is the essential first step in cellular respiration. Oxidative phosphorylation and electron transport also serve as a major source of cellular energy and occur within the mitochondria. During oxidative phosphorylation, electrons derived from NADH and FADH₂ combine with oxygen and the energy released is used to drive the synthesis of ATP⁴. It is important to note that the mechanism by which energy is derived from these processes is fundamentally different. In the final reaction of glycolysis, the high-energy phosphate of phosphoenolpyruvate is transferred to ADP, yielding pyruvate plus ATP. This direct transfer of high-energy phosphate groups doesn't occur in oxidative phosphorylation, but rather the energy derived from the electron transport is coupled to the generation of a proton gradient across the mitochondrial membrane. This potential energy stored in this gradient is harvested by a fifth protein complex, which couples the favorable flow of protons back across the membrane to the synthesis of ATP⁴.

THE BENEFITS.

Skin

Cellular Energetics Glycolysis

Oxidative Phosphorylation



Reduce Cellular Senescence

SA-Beta-Gal Analysis



Wake Up the Skin

Undereye Study



Undereye Mechanism

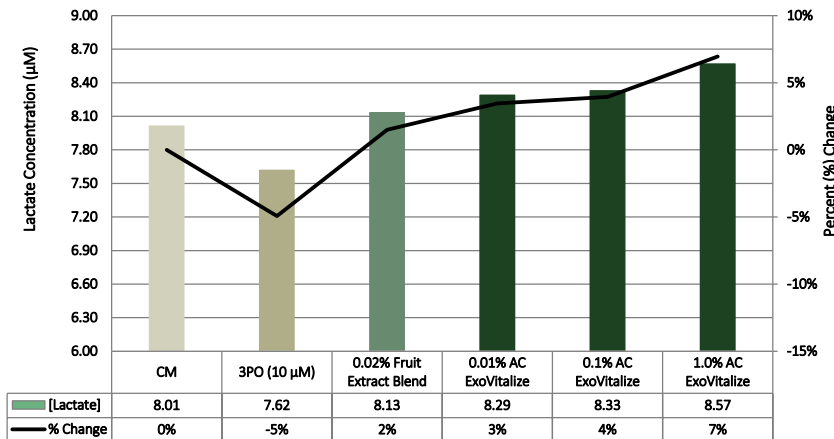
Endothelial Permeability



THE EFFICACY.

Glycolysis.

An L-Lactate Assay was conducted to assess the *in vitro* effect of AC ExoVitalize to stimulate glycolysis in dermal fibroblasts. Lactate is a by-product of glycolysis and the amount produced by cells is directly proportional to the rate of glycolysis. Activating this biological process maintains cellular homeostasis, vitality, and can be critical during cellular stress. The key active ingredients in AC ExoVitalize, *Citrus paradisi* (Grapefruit) Fruit Extract and *Citrullus lanatus* (Watermelon) Fruit Extract, were tested to demonstrate the superior nature of BioAuthentic Exosomes as a delivery system.



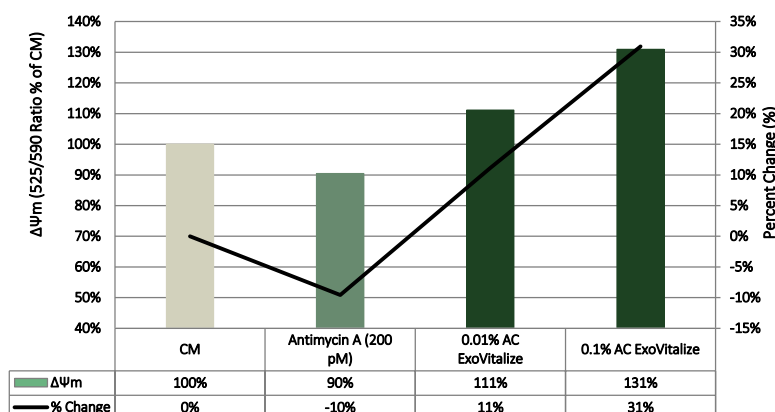
AC ExoVitalize increased glycolysis by 3%, 4%, and 7% compared to untreated fibroblasts (tested at 0.01%, 0.1%, and 1.0%)

Cellular Energetics.

Increased Cellular Energy & Revitalized the Skin

Oxidative Phosphorylation.

A Mitochondrial Membrane Potential Assay was conducted to assess the *in vitro* effect of AC ExoVitalize to stimulate oxidative phosphorylation in dermal fibroblasts. One driving force of oxidative phosphorylation is the mitochondrial membrane potential ($\Delta\Psi_m$) which represents the transmembrane potential of hydrogen ions. Maintaining $\Delta\Psi_m$ is necessary as the proton flux from cytosol to the matrix is harnessed to generate ATP.



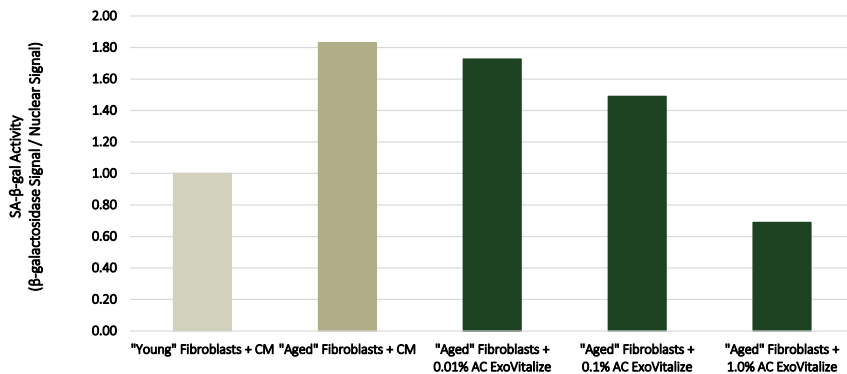
AC ExoVitalize elicited a 11% and 31% increase in $\Delta\Psi_m$ compared to untreated fibroblasts (tested at 0.01% and 0.1%)

Cellular Energetics.

Maintained Cellular Homeostasis & Increased Mitochondrial Function

SA-Beta-Gal Analysis.

A cellular aging model was developed to assess the *in vitro* effect of AC ExoVitalize to reduce SA-Beta-gal activity in “aged” fibroblasts. Cellular senescence is a state of permanent cell cycle arrest that accompanies aging and contributes to a decline in normal skin function and physiology. SA-Beta-gal is the gold standard biomarker to identify senescence *in vitro* as the enzyme beta-galactosidase explicitly accumulates in the lysosomes of senescent cells.



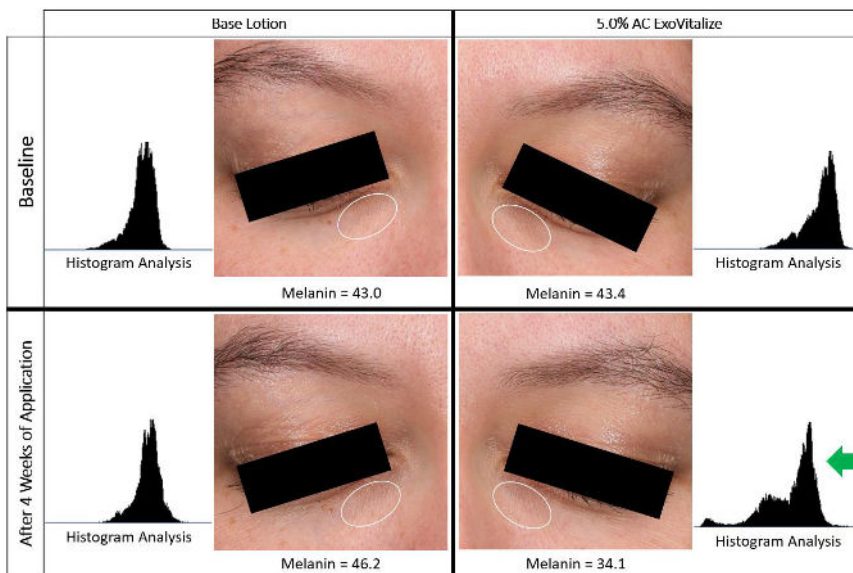
AC ExoVitalize elicited a 6%, 19%, and 62% reduction in SA-Beta-gal activity compared to untreated fibroblasts (tested at 0.01%, 0.1%, and 1.0%)

Anti-Aging.

Reduced Cellular Senescence & May Attenuate Alterations in Skin Structure

Undereye Study.

Dark circles and discoloration can influence the appearance of aging and fatigue under the eye. An *in vivo* study was conducted over a period of six weeks to evaluate the effect of AC ExoVitalize on undereye skin pigmentation to determine its effect of reducing discoloration. Participants applied specific products to particular undereye areas twice a day for four weeks with measurements collected once a week, followed by a two week regression period. Photographs were taken using the VISIA Complexion Analysis System and pigmentation measurements were obtained via the DermaLab Combo handheld probe to assess undereye melanin levels.



AC ExoVitalize decreased undereye skin pigmentation by 13% and undereye color intensity by 15% compared to baseline readings (tested at 5%)

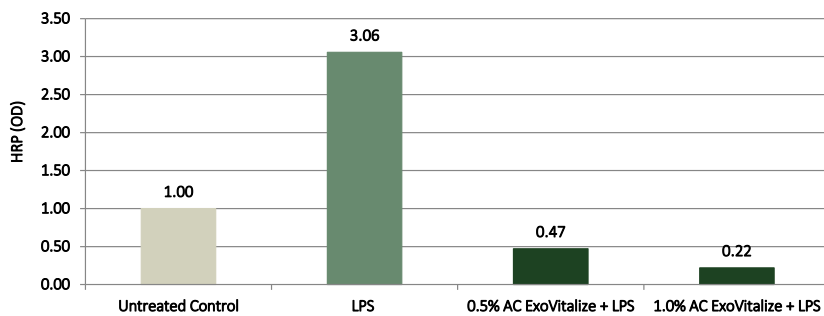
Wake Up Skin.

Reduce Undereye Circles & Gain a Youthful Appearance

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Endothelial Permeability Assay.

On a cellular level, endothelial function modulates vascular integrity. In particular, endothelial cell permeability plays a fundamental role in the formation of dark circles as increased permeability leads to a pooling of deoxygenated blood under the eye, resulting in discoloration and the appearance of aging. The relationship between dermal fibroblasts and dermal endothelial cells is vital to maintaining vascular integrity. Specifically, fibroblasts synthesize the extracellular matrix, which provides an anchor point for endothelial cells and greatly reduces endothelial permeability. Accordingly, an Endothelial Permeability Assay was conducted to assess the *in vitro* effect of AC ExoVitalize to reduce endothelial permeability via fibroblast-released signaling molecules. Complete media treated with lipopolysaccharides (LPS) was used to stimulate an inflammatory environment, representing the positive control. Each solution was then treated with streptavidin-horseradish peroxidase (HRP) for a colorimetric reaction. Optical density (OD) was read at 450nm to measure the amount of permeability.



AC ExoVitalize decreased endothelial permeability compared to LPS-treated fibroblasts by 85% and 93% (tested at 0.5% and 1.0%)

Wake Up Skin.

Reduce Pooling Under the Eye
&
Attenuate Undereye Aging

References:

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Active Concepts LLC
Lincolnton, NC- USA
Tel +1 704-276-7100
info@activeconceptsllc.com

Active Concepts SRL
Bareggio, (Milano) ITALY
Tel +39 02 90360719
info@activeconcepts.it

Active Concepts LLC, Asia
Kaohsiung, Taiwan
Tel + 886 73599900
info-asia@activeconceptsllc.com.tw



Website

www.activeconceptsllc.com



Social Media

[@activeconceptsllc](https://www.instagram.com/activeconceptsllc)

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