Balancing Skin Tone
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Aesthetic perfection is now the consumer standard. Cosmetic scientists, dermatologists and psychologists, have gathered sufficient data to be able to show with confidence that uneven skin tone and colour distribution plays an important role in perception of apparent age, attractiveness and health. Young skin has a natural luminescence of its own so we judge the age of a person primarily by their facial skin tone and not by the proliferation of fine lines and wrinkles.

Consumers appreciate more and more the importance of illuminating skin and skin luminosity on our health and wellbeing so it is easy to understand why our interest in products that help skin glow has increased in recent years and is expected to go on increasing.

Skin lighteners are no longer solely a province of Asia, they are now dominant in Western Markets, specifically the US and Europe. Culturally, these preparations are popular for their ability to achieve fairer, whiter-looking skin in the East, with the desire for achieving a ‘porcelain’ or ‘glass-like’ complexion. In the West skin lighteners have been redefined into anti-aging applications, facilitating brighter, more radiant skin. The long standing aesthetic standard of Asia has transformed the cosmetic market globally.

Products successful in this category must provide rapid and visually perceivable results without causing irritation, harm or damage to the skin. At Active Concepts our focus is on natural technology platforms which offer effective skin tone balancing solutions without the irritation associated with more traditional skin lightening products.
Melanogenesis

Melanin is the skin’s natural protection from exposure to the sun, providing the first physio-
chemical defence against ultraviolet (UV) damaging rays. It is the primary determinant
of human colouring and can be found not only in the skin, but also in the hair and eyes.
Melanin is produced by melanocytes, which are found in the basal layer of the epidermis.
They are dendritic in shape, (Figure 1) branching out over neighbouring keratinocyte cells,
as a protective arrangement to prevent UV induced damage to the cells’ nuclei.

Despite such a wide and unique variation in skin colour everybody has the same number of
melanocyte cells present in their skin. However, the amount of melanin produced increases
temporarily in response to UV exposure and so a sun tan or areas of skin hyperpigmentation
are produced. Melanin pigment can absorb both UV and visible light, protecting the
surrounding cells from DNA damage and the dermis layer below from light irradiation.

Melanin consists of two different pigment molecules: pheomelanin, which is a yellow
to reddish color, and eumelanin, which is generally black or brown. Darker skin typically
contains more eumelanin, while lighter skin has more pheomelanin. It is thought that
eumelanin is able to provide a greater level of protection from the sun.

Melanogenesis is the process by which melanocyte cells produce melanin. Melanin is
synthesized within small organelles called melanosomes. As the melanosomes become
full, they move into the slender arms of melanocytes, from where they are transferred to
the keratinocytes. Keratinocytes that contain melanin granules then proceed along the
differentiation pathway, moving up through the epidermal layers until they become part
of the stratum corneum, providing our visible skin colour and tone.
The melanogenic pathway for the production of eumelanin and pheomelanin both involve a chain of enzymatic and nonenzymatic reactions with tyrosine playing a key role. Eumelanin production begins with the enzymatic oxidation of L-tyrosine to dopaquinone to form an intermediate called an indolic monomer, which is then converted to eumelanin. Pheomelanin production begins when dopaquinone reacts with cysteine to form the intermediate precursor called cysteinyldopa, which is then converted into pheomelanin.

Extrinsic and intrinsic stressors such as exposure to UV and histamine release can affect the cycle of melanogenesis through a cascade of inflammatory events. Inflammation can lead to hyperpigmentation which results in visible dark spots on the skin.

Extrinsic stimuli such as UV and histamine release can affect the cycle of melanogenesis through a cascade of inflammatory events. Inflammation can lead to hyperpigmentation which results in visible dark spots on the skin.

Additionally, as we age there is a decrease in the number of melanocyte cells present within the skin. Less melanin is readily available when the body is irradiated by UV light and so the damaging waves pass more easily through to the dermis. It is here in the dermal tissue that most of the damage caused by light irradiation occurs, and the effects of this are also visible. Under the influence of UV the dermal fibroblasts produce abnormal dermal connective tissue. Instead of consistent parallel bundles being formed, the fibres appear more like disorganised spaghetti. This mechanism is known as “solar elastotic degenerative change” and causes the skin to become wrinkled, loose its firmness and weakens the barrier.

A decrease in melanocytes also exposes more dividing keratin cells to UV rays, as the dendritic arms of the pigment producing cells no longer protect them. Those melanocytes that are left tend to group together forming areas of hyperpigmentation, otherwise known as age spots. It is easy to understand that younger skin, with a higher level of melanocyte cells, appears even in color and tone vs aging and sun exposed skin which can become pigmented.

The idea of brand differentiation through the mechanism of action is a key competitive factor in skin lightening products as there are limits in claims and actives across most markets. At Active Concepts we are focused on developing materials for balancing the appearance of the skin colour via different pathways such as: blocking histamine receptors and reducing inflammation, inhibiting the tyrosinase cycle and encouraging the production of the lighter pheomelanin in place of the darker eumelanin. This choice in function allows formulators to create ideal skin lightening products specifically tailored to individual needs.
## Skin Balance

Melanin is the compound responsible for skin pigmentation. There are two distinct types of melanin: pheomelanin, which is typically a yellow or orange pigment, and eumelanin, which is a dark-brown pigment. By preventing melanin synthesis we can effectively reduce hyperpigmentation. At Active Concepts we offer different biological mechanisms to block this reaction:

<table>
<thead>
<tr>
<th>Product Code &amp; Name</th>
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<th>Multifunctional Benefits</th>
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| 22040 - Active.Lite® | Butylene Glycol & Saccharomyces/Grape Ferment Extract | A sustainable active created through the yeast fermentation of grape biomass, this novel mechanism of action works to inhibit melanin production by blocking histamine 3 receptors. Demonstrated results show a reduction in the appearance of dark spots and other hyperpigmentation on hands, face, and décolleté without irritation. | - Patent Pending Skin Lightener  
- Naturally Potent & Sustainable  
- Lightening Results in Under 14 days  
- Evens Skin Tone  
- Brightens Complexion |
| 20463PF - AC DermaPeptide Lightening PF | Lactobacillus Ferment Lysofilysate & Lactobacillus Ferment | Derived from Lactobacillus, this natural active is intended to prevent eumelanin synthesis while simultaneously increasing pheomelanin synthesis to even skin tone and reduce the appearance of hyperpigmentation. It is recommended for use in long-term lightening formulas, and may allow consumers to easily lighten the skin to achieve a more even skin tone. | - Reduces Hyperpigmentation  
- Prevents Melanin Synthesis  
- Great for long term use |
| 16098 - AC Cinnamon Liposome | Aqua & Cinnamomum Cassia Bark Extract & Lactobacillus Ferment | A liposomal encapsulation containing Cinnamomum cassia bark extract. Natural phyto-compounds found in Cinnamomum cassia bark have been shown to inhibit tyrosinase activity by chelating copper and ultimately preventing melanin production. A natural delivery system for lightening and evening skin tone whilst proving to be a powerful antioxidant. | - Safe, Natural Skin Lightening  
- Sequesters Copper to Down-Regulate Tyrosinase Activity  
- Balances Skin Tone For a Flawless Glow  
- Antioxidant Protection  
- Enhanced Delivery |
| 20364G - ACB Lemon Peel Extract G | Glycerin & Aqua & Lactobacillus/ Lemon Peel Ferment Extract & Leuconostoc/Radish Root Ferment Filtrate | Lemon peel extracts have been shown to have anti-tyrosinase activity working as a natural and effective alternative to hydroquinone for inhibiting tyrosinase production. Traditionally sourced for vitamin C content and natural acids this fermented lemon peel extract can help to balance and even skin tone. | - Antioxidant  
- Natural Skin Lightening  
- Evens Skin Tone  
- Anti-Aging |
Exfoliation

Combining skin lightening/balancing actives with exfoliants can help to convey visually perceivable results in a shorter period of time. Natural Alpha Hydroxy Acids (AHAs) or enzyme exfoliants work to increase cellular turnover, revealing fresher, brighter skin and the effects of a skin lightening material.

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</table>
| 20343LNZ - ACB Fruit Mix   | Aqua & Vaccinium Myrtillus Fruit Extract & Saccharum Officinarum (Sugar Cane) Extract & Citrus Aurantium Dulcis (Orange Fruit Extract & Citrus Limon (Lemon) Fruit Extract & Acer Acer Saccharum (Sugar Maple) Extract | Standardised for Lactic Acid (28-32%), Glycolic Acid (12-17%), Citric Acid (2-6%), Malic Acid (max. 1%), and Tartric Acid (max. 1%), this complex of fruit extracts help to normalise the skin by weakening corneocyte adhesion along the stratum corneum. Enhanced exfoliation leads to improved cellular proliferation and a fresher, brighter complexion. | • Moisturizing and conditioning  
• Increases rate of cellular renewal  
• Immediately perceivable results  
• Decreases appearance of wrinkles |
| 10229 - ABS White Willow Bark Extract Powder | Salix Alba Bark Extract                                                  | Traditionally used as a remedy for its anti-inflammatory and analgesic properties, willow bark extracts are employed as a source of natural salicylic acid. Natural salicylic acid is known to provide benefits of exfoliation and antimicrobial activity, without irritation. This natural extract can work to exfoliate the skin to reveal a fresh and bright complexion. | • Natural Salicylic Acid Alternative  
• Standardized for 53.0 - 65.0% Salicylates  
• Antimicrobial Action  
• Promotes an Increased Cellular Renewal  
• Excellent Antioxidant Protection  
• Ideal for Problem Skin Applications |
| 16505 - AC Sea Acids Complex | Aqua & Lactic Acid & Ascophyllum Nodosum Extract & Malic Acid & Alginote | Lactic acid may be used to enhance epidermal moisturisation, while malic acid has been shown to contribute to the skin's elasticity. Coupled them long chain polysaccharides that isolated from Algae to increase the smooth even texture of the skin while minimising the potential for irritation. AC Sea Acids Complex may be used as an alternative to physical exfoliators that can have a harsh effect on the skin. It is intended to gently exfoliate the skin while increasing elasticity and improving texture. | • AHA Based Exfoliation  
• Marine / Spa trend  
• Moisturising  
• Smoothing |
| 20496 - ACB Modified Pumpkin Enzyme PF | Lactobacillus/Pumpkin Fruit Ferment & Leuconostoc/Radish Root Ferment Filtrate | A gentle yet effective exfoliator derived from pumpkin. By fermenting pumpkin with Lactobacillus lactis, and through the use of selective filtration techniques, proteolytic fractions are isolated. Pumpkin proteolytic enzymes help to digest proteins that have accumulated on the skin's surface serving to release trapped bacteria. Enhance cellular renewal through exfoliation for a smooth, even skin texture. | • Efficient yet gentle Exfoliation  
• Versatile in Formulations  
• Intense Moisturizing Benefits |
## Anti-Inflammation

Inflamed skin often appears red, irritated and blotchy. Combining anti-inflammatory materials into skin balancing applications can provide an optimal environment for a calm and even complexion.

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<tr>
<td>20224PF - ACB Yogurt Dermal Respiratory Factor PF</td>
<td>Lactobacillus Ferment Lysoate Filtrate &amp; Leuconostoc/Radish Root Ferment Filtrate &amp; Populus Tremuloides Bark Extract</td>
<td>This product is created by stressing Lactobacillus bulgaricus cells with UV light. As a self-defence mechanism, these cells secrete reparative components called heat shock proteins (HSP). These proteins are then isolated using a series of biofermentation and filtration techniques to help calm and soothe red and inflammed skin.</td>
<td>• Promotes Homeostasis  • Increases Collagen Synthesis  • Soothing  • Prebiotic Marketability  • Increases Cellular Respiration</td>
</tr>
<tr>
<td>20219PF - AC Dermal Respiratory Factor Advanced PF</td>
<td>Aqua &amp; Saccharomyces Lysate Extract &amp; Lactobacillus Ferment</td>
<td>A unique yeast derived active. Live Yeast Cell Derivatives (LYCD) are produced by exposing yeast cells to stress, such as UV radiation. These synergistically active compounds have been shown to stimulate cellular metabolism through promoting an increase in cellular energy, whilst also helping to minimise irritation and promote collagen synthesis.</td>
<td>• Global Metabolic Stimulant  • Efficacious Soothing Benefits  • Promotes Wound Healing  • Stimulates Collagen Production  • Stimulates Elastin Production  • Increases Cellular Respiration</td>
</tr>
<tr>
<td>16882 - Phytofuse Rejuvenate®</td>
<td>Salvia Hispanica Seed Extract &amp; Lactobacillus Ferment</td>
<td>A natural alternative for the current carbohydrate chemistry seen in the medical industry for the creation of synthetic scaffolding that promotes wound healing. The isolated exopolysaccharides extracted from Salvia hispanica (Chía) seeds have demonstrated their ability to aid in cell proliferation and thus impart wound healing and anti-inflammatory properties to the skin. A functional, active ingredient that improves the slip and cushion in finished formulations, Phytofuse Rejuvenate® soothes the skin and provides antioxidant and moisturisation benefits.</td>
<td>• Anti-Inflammatory  • Promotes Repairing / Healing  • Natural Film-Former  • Intense Antioxidant  • Pro-Collagen Synthesis</td>
</tr>
<tr>
<td>20228 - AC Agave HSP</td>
<td>Saccharomyces/Agave Americana Leaf Ferment Filtrate &amp; Leuconostoc/ Radish Root Ferment Filtrat</td>
<td>A fermentation of agave with Saccharomyces cerevisiae. As a result of exposure to extreme environmental stress agave has developed a defence system of secondary metabolites and heat-shock proteins. By capitalising on these protective benefits this soothing active can moisturise the skin, reduce redness and stimulate collagen synthesis.</td>
<td>• Anti-inflammatory  • Soothing &amp; Calming  • Stimulates Collagen Production  • After sun care</td>
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</table>
Antioxidants are essential for protecting the skin from free radical damage, often caused by exposure to extrinsic stressors. It is well documented that UV irradiation exacerbates the formation of hyperpigmentation (age spots) on the skin. Using antioxidants to help protect the skin from this extrinsic stress can in turn help to maintain a healthy and even complexion.

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<tr>
<td>16587 - Phyto-Biotics Acai®</td>
<td>Euterpe Oleracea Fruit Extract &amp; Lactobacillus Ferment</td>
<td>Found in acai cell wall components, ferulic acid protects the plant from microbial attack and UV exposure. In turn these properties of ferulic acid, produced by acai stem cell propagation, can be transferred into cosmetic applications providing potent antioxidant activity and working as an antioxidant extender for other materials such as vitamin C. Standardised for 4.0 – 5.0% Ferulic Acid content.</td>
<td>• Antioxidant • Photoprotection boost • Anti-aging</td>
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<tr>
<td>20431PF - ACB Tonka Bean Bioferment PF</td>
<td>Lactobacillus/ Dipteryx Odorata Seed Ferment Filtrate &amp; Leuconostoc/Radish Root Ferment Filtrate</td>
<td>Polyphenols from tonka beans are isolated using a fermentation process. These polyphenols, when activated by UV, absorb light in the invisible spectra and emit light in the visible spectra. This helps to increase luminescence of the skin and promote an even skin tone, whilst providing antioxidant protection.</td>
<td>• Antioxidant • Chromatherapy • Phototherapy • Protectant</td>
</tr>
<tr>
<td>60105PF - AC Vitamin ACE-BC Liposome PF</td>
<td>Aqua &amp; Phospholipids &amp; Leuconostoc/ Radish Root Ferment Filtrate &amp; Retinyl Palmitate &amp; Ascorbyl Palmitate &amp; Tocopheryl Acetate &amp; Beta-Carotene</td>
<td>A liposomal encapsulation of essential vitamins A, C and E in combination with beta-carotene. This system allows for enhanced penetration of the actives into the skin and also for an effective delivery of oil-soluble vitamins in an aqueous environment. Works to enhance cell function, promote skin health and provide antioxidant protection.</td>
<td>• Antioxidant • Encapsulation • Enhanced delivery • Increased stability</td>
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Formulation: Energizing Facial Serum

Revitalize, even skin tone, exfoliate, and supercharge to reveal and maintain healthy, glowing, youthful looking skin. A vitamin-enriched, lightweight facial serum that helps restore radiance and deliver much needed therapeutic benefits so skin can shine. Perfect for all skin types, especially problem skin.

Manufacturing Procedure:
1. Charge water into main beaker and begin propeller mixing. A vortex should form.
2. Add each ingredient individually and allow complete dispersion.

Use Directions:
Apply a pea size amount to clean skin. May be used under a moisturizer or alone.

Specification Values:
Appearance: Opaque Serum
pH-value: 5 - 5.5
Viscosity (Brookfield: TF; Speed 10 rpm): 1000 - 5000 cps
Stability: >3 months stable at 4oC, 23oC, and 45oC

Microbiological Stability: Proven
PCPC Section 20 Method 3 - Determination of Preservation Adequacy of Water-Miscible Personal Care Products.

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<th>Trade Name</th>
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<tr>
<td><strong>Phase A</strong></td>
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<td></td>
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<tr>
<td>Deionized Water</td>
<td>Aqua</td>
<td>22.8</td>
<td>Local</td>
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<tr>
<td>Dermafoam PA-3</td>
<td>Sodium Phytate</td>
<td>0.2</td>
<td>Dr. Straetmans</td>
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<tr>
<td>AC Alg Moist EAU</td>
<td>Aqua &amp; Algae Extract</td>
<td>50.0</td>
<td>Active Concepts</td>
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<tr>
<td>Glucam E-20</td>
<td>Methyl Gluceth-20</td>
<td>1.0</td>
<td>Lubrizol</td>
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<td>AC Soluble Collagen</td>
<td>Soluble Collagen</td>
<td>2.0</td>
<td>Active Concepts</td>
</tr>
<tr>
<td>AC DermaPeptide Revitalizing PF</td>
<td>Hydrolyzed Rice Protein</td>
<td>4.0</td>
<td>Active Concepts</td>
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<tr>
<td>ProRevive Blemish Balm Complex</td>
<td>Lactobacillus/Faixa Alba Bark Ferment Filtrate</td>
<td>2.0</td>
<td>Active Concepts</td>
</tr>
<tr>
<td>AC Vitamin ACE Liposome</td>
<td>Aqua &amp; Phospholipids &amp; Retinyl Palmitate &amp; Ascorbyl Palmitate &amp; Tocopheryl Acetate &amp; Beta-Carotene</td>
<td>1.0</td>
<td>Active Concepts</td>
</tr>
<tr>
<td>ACB Fruit Mix</td>
<td>Aqua &amp; Vaccinium Myrtillus Fruit Extract &amp; Saccharum Officinarum (Sugar Cane) Extract &amp; Citrus Aurantium Dulcis (Orange) Fruit Extract &amp; Citrus Limon (Lemon) Fruit Extract &amp; Acor Acer Saccharum (Sugar Maple) Extract</td>
<td>5.0</td>
<td>Active Concepts</td>
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<tr>
<td>ACB Lemon Balm Extract</td>
<td>Aqua &amp; Melissa Officinallis Extract</td>
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<tr>
<td>ABS Lemon Peel Extract</td>
<td>Aqua &amp; Citrus Medica Limonum (Lemon) Peel Extract</td>
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<td>Active Concepts</td>
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<tr>
<td>Leucida Liquid SF</td>
<td>Lactobacillus Ferment</td>
<td>4.0</td>
<td>Active Micro Technologies</td>
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<tr>
<td>AMTicide Coconut</td>
<td>Lactobacillus &amp; Cocos Nucifera (Coconut) Fruit Extract</td>
<td>2.0</td>
<td>Active Micro Technologies</td>
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</table>
References


