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# AHCare™

Amphoteric Hydroxy Acid Complexes

All the benefits of AHAs with enhanced tolerance

# Alpha Hydroxy Acids (AHAs)

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- Alpha Hydroxy Acids (AHAs) have a long history of use in cosmetics:
  - Cleopatra is said to have bathed in spoiled milk, containing lactic acid,
  - Women in the court of France used spoiled wine, containing tartaric acid, for cosmetic purposes.
- The best known AHAs are:
  - Glycolic acid (from sugar cane),
  - Lactic acid (from milk).
- Other AHAs, such as malic-, citric- and tartaric acids are found in fruits:
  - The name fruit acids is also often used for AHAs.



# Alpha Hydroxy Acids (AHAs)

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- The well-known benefits of AHAs include:

Exfoliation

Moisturization

Reduction of fine lines and wrinkles

Collagen synthesis

Firming

Skin lightening



- Drawback of AHA treatment: stinging or burning sensation (due to rapid penetration of AHA free acid molecules into the skin at low pH), especially on sensitive skin.

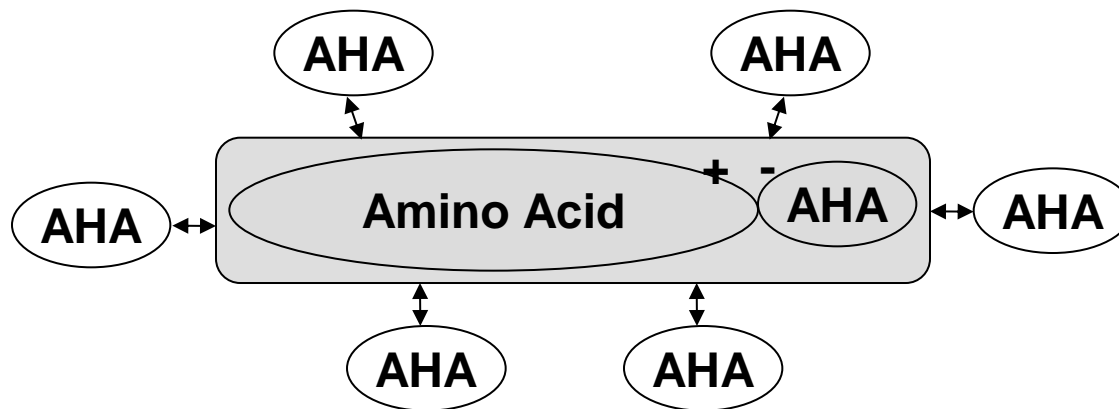
 **A control-release system for AHAs, that reduces irritation, is required**

# Amphoteric Hydroxy Complexes (AHCs)

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- Amphoteric Hydroxy Complexes (AHCs) give the **same benefits** as AHAs **with less irritation**<sup>1,2</sup>
- AHCs are obtained by mixing AHAs with amphoteric compounds such as amino acids<sup>1</sup>



**Schematic model of central amino acid/AHA complex (in blue) with coordinated AHAs**

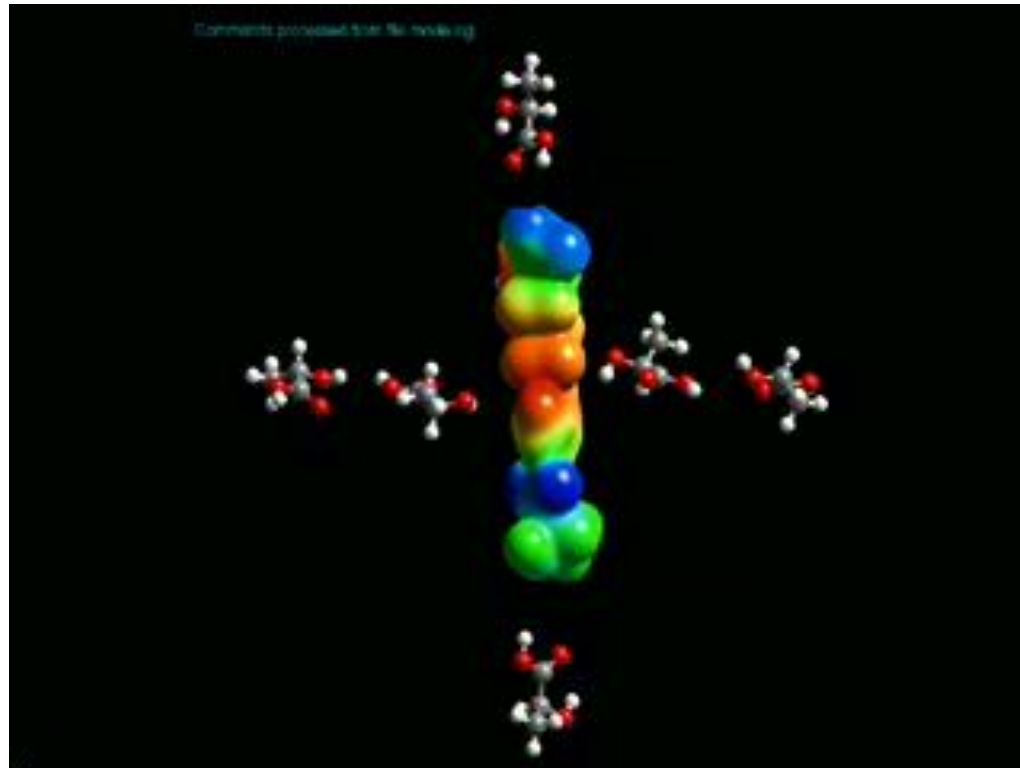
<sup>1</sup>R. J. Yu and E. J. Van Scott, "Amphoteric composition and polymeric forms of alpha hydroxy acids and their therapeutic use," US Patent 5,091,171 (1992).

<sup>2</sup>Kraechter H.U., McCaulley J.A. Edison B, Geen B. Milora D.J. Amphoteric Hydroxy Complexes: AHAs with reduced stinging and irritation. Cosmetics & Toiletries 2001; 116 \*1): 47-52

# Amphoteric Hydroxy Complexes (AHCs)

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Molecular modeling image of an arginine/lactic acid central complex with 6 surrounding lactic acid molecules

# Enhanced Tolerance Model of AHCs

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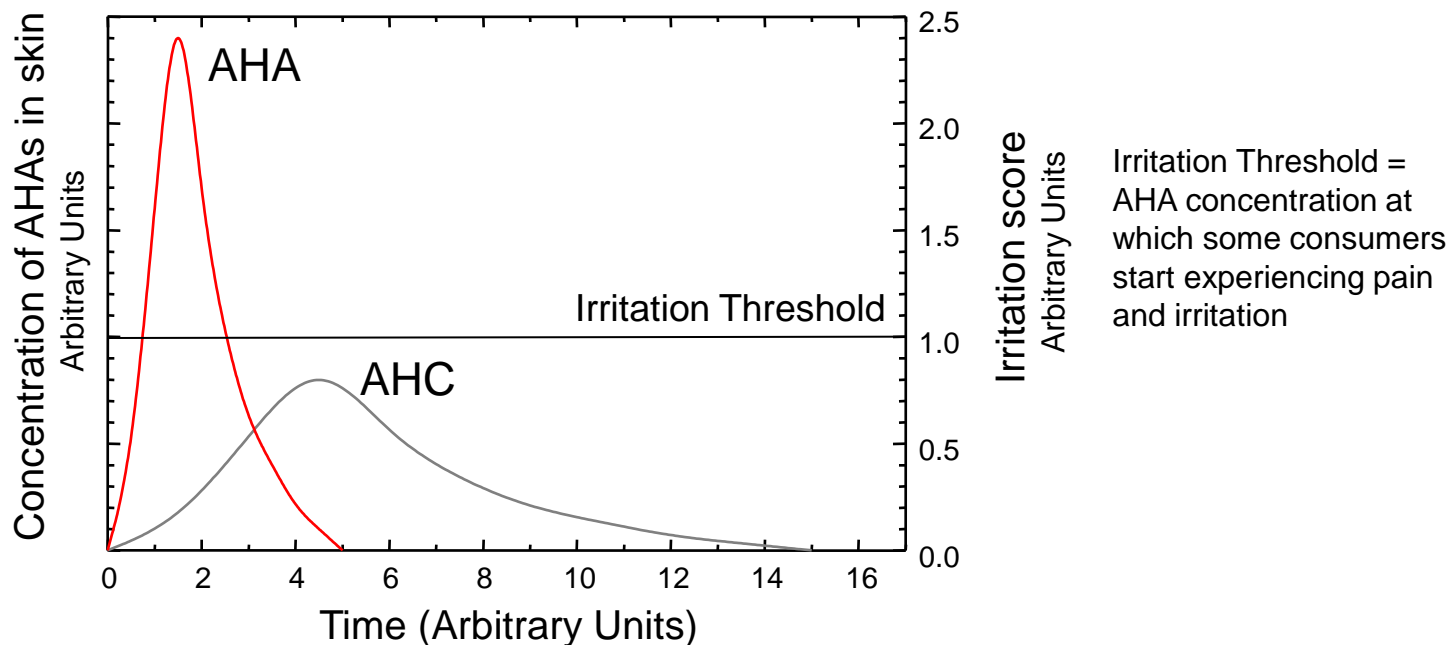
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- 
- Binding forces exist between central complex and coordinated AHAs
  - Slow release of AHAs from the complex into the skin
  - Lower peak concentration of AHAs in the skin
  - Virtual elimination of skin irritation
  - Possible extension of benefits of AHAs to more sensitive skin

# Enhanced Tolerance Model of AHCs

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Schematic diagram (model)<sup>2</sup> illustrating the kinetic mechanism responsible for the reduced stinging and irritation of amphoteric hydroxy complexes.

**With AHCs the peak concentration of AHAs in the skin is lower, due to the slow release mechanism. As a result AHCs are less irritating.**

<sup>2</sup>Kraechter H.U., McCaulley J.A. Edison B, Geen B. Milora D.J. Amphoteric Hydroxy Complexes: AHAs with reduced stinging and irritation. Cosmetics & Toiletries 2001; 116 (1): 47-52

# Amphoteric Hydroxy Complexes

## Efficacy tests

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Demonstration of enhanced tolerance of AHCs

- immediate effect

Stimulation of cell turnover

- from an AHCare™ solution



# Clinical test: enhanced tolerance of AHCs - Immediate Effect

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**Aim:** To prove the increased skin tolerance for amphoteric hydroxy acid complexes facial sting studies were carried out.

## Protocol

The stinging potential was evaluated by a panel that was identified in a pre-screening as being sensitive to lactic- or glycolic acid.

Specific (low) pH and/or (high) AHA concentrations were selected in order to be able to evaluate stinging.

4 different AHCs were evaluated:

- AHC with lactic acid:arginine = 2.5:1
- AHC with lactic acid:arginine = 20:1 (AHCare L65)
- AHC with glycolic acid:arginine = 2.5:1
- AHC with glycolic acid:arginine = 15:1 (AHCare G60)

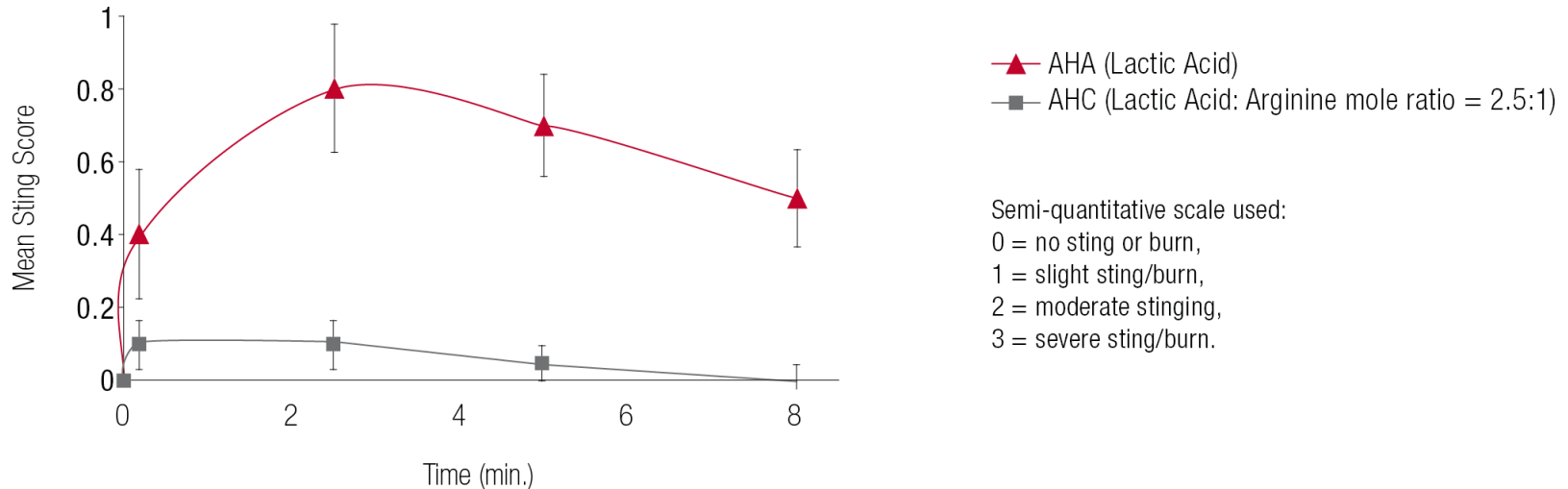
In all cases the acid concentration in the AHC and the free acid solution was equivalent

# Clinical test: enhanced tolerance of AHCs - Immediate Effect

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**Results:** AHC (lactic acid:arginine = 2.5:1) vs. 20% Lactic Acid, neutralized with  $\text{NH}_4\text{OH}$  to pH 3.5



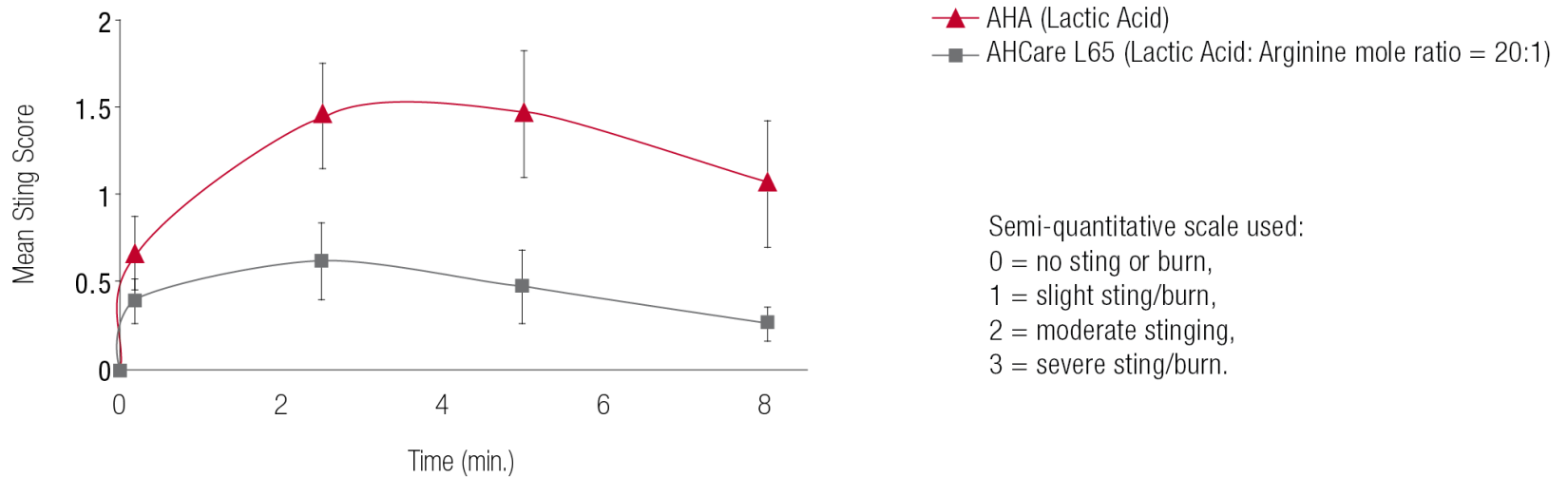
**The AHC solution is significantly less irritating than the AHA solution**

# Clinical test: enhanced tolerance of AHCs - Immediate Effect

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**Results:** AHC (glycolic acid:arginine = 2.5:1) vs. 10% Glycolic Acid, neutralized with  $\text{NH}_4\text{OH}$  to pH 3.1



**The AHC solution is significantly less irritating than the AHA solution**

# Clinical test: increase of cell turnover: AHCare™ solution

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**Aim: To demonstrate that AHCs have the same efficacy as AHAs**

## **Protocol**

Clinical study on 17 female volunteers ages 25-59



Staining of the skin (volar forearm) by Dansyl Chloride Patches



Randomized treatment 2x daily during 21 days with a 10 % lactic acid solution or a 14.7% AHCare™ L65 solution neutralized to pH 2.4 with NH<sub>4</sub>OH  
Control area = non-treated



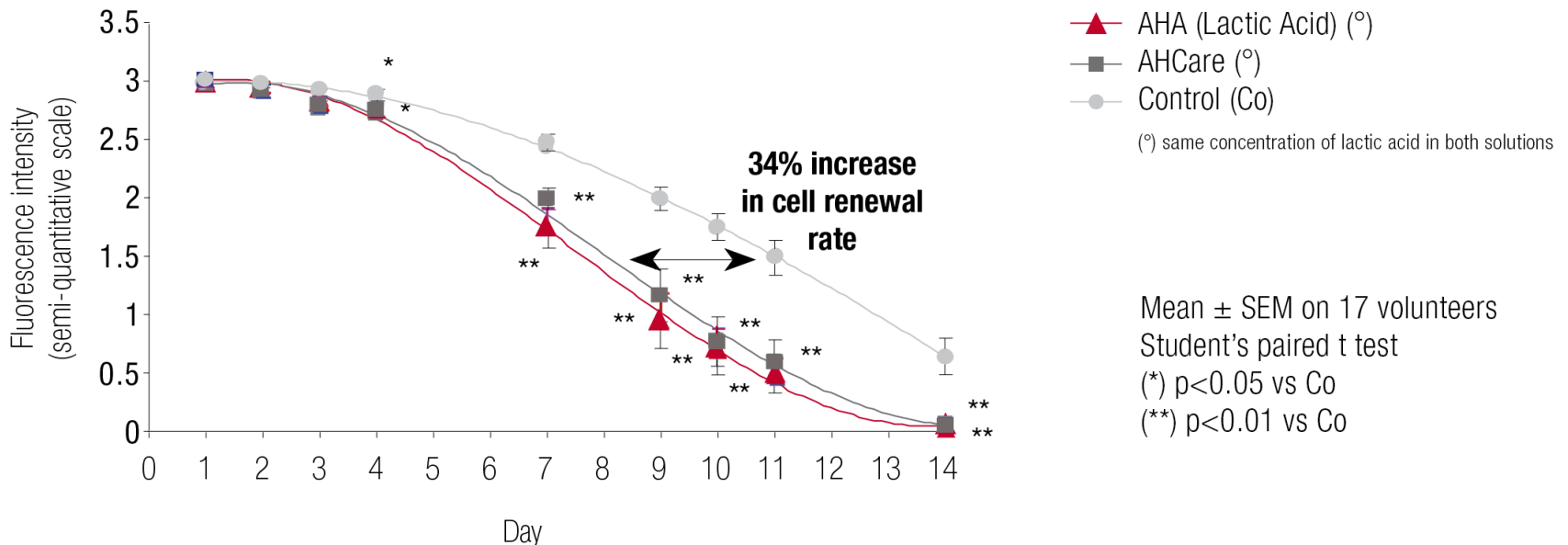
Monitoring of the decrease in skin fluorescence by a trained expert using a semi-quantitative scale

# Clinical test: increase of cell turnover: AHCare™ solution

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**Results:** Solution with 14.7% AHCare L65 vs 10% lactic acid solution, both neutralized with  $\text{NH}_4\text{OH}$  to pH 2.4



**AHCare™ has increased the cell renewal rate by 34%**  
**The efficacy is as good as a solution with the same concentration of lactic acid**

# Efficacy data: conclusion

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AHCare™ amphoteric hydroxy complexes were shown to be:

Less irritating than AHAs

As effective as AHAs



**With AHCare™ you can have all the benefits of AHAs  
the mild way!**

# Products

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**AHCare™ L 65**: patented complex of lactic acid and L-arginine, 75% total actives, lactic acid /arginine mole ratio = 20:1

# Technology

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## Patented Technology

AHCare based on glycolic and/or lactic acid is patented technology.

This technology has been exclusively licensed.

Using AHCare L65 will allow you to use this technology free of license.

Key patent:

R. J. Yu and E. J. Van Scott, "*Amphoteric composition and polymeric forms of alpha hydroxy acids and their therapeutic use,*" US Patent 5,091,171 (1992).



# Cosmetic applications

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Exfoliating products

Anti-age face care

Products for skin lightening, anti-age spots

Moisturizing face- and body care

# Characteristics

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**Aspect** : Water clear, colorless liquid with a characteristic odor

**Dose of use** : 5 to 10%.

**Solubility** : soluble in water, insoluble in oils.

**INCI Name**

**AHCare L65** : Lactic Acid (and) Aqua (and) Arginine

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