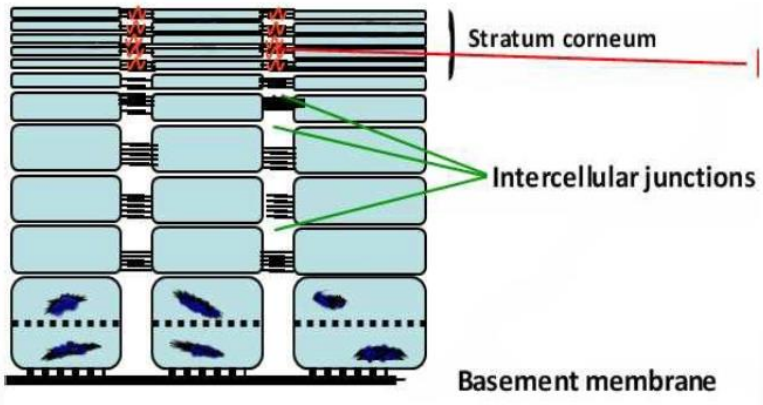
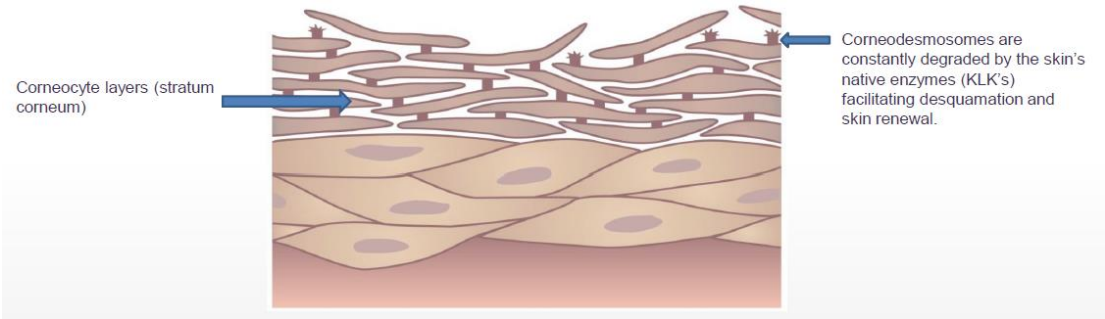
SYNERGIE SKIN
CLEAN SCIENCE

CLINICAL DATA – BIOFERMENTED YEAR AND SOY AMINO ACID COMPLEX

Natural Epidermal Turnover:



- The external surface of the epidermis is formed by layers of corneocytes bound together to create a protective barrier essential to skin health.
- Skin's natural cell turnover can take from two to four weeks in healthy individuals
- Breakdown of the inter-corneocyte attachment is necessary for the normal process of skin renewal via exfoliation.
- Corneocytes are connected to each other via protein assemblies called corneodesmosomes

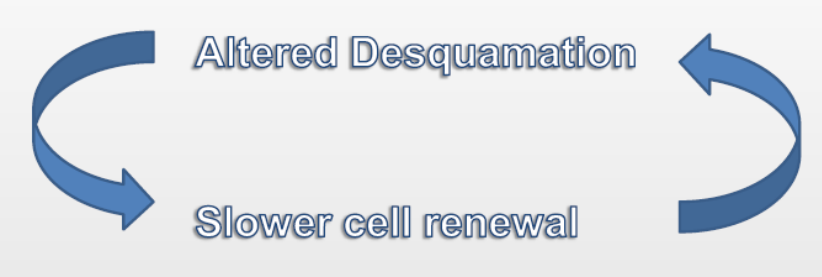


- Even though several enzymes (serine, cysteine and aspartate proteases) are capable of degrading corneodesmosomes connections in a very specific pattern, desquamation of the stratum corneum is very complex process and not yet fully understood.

Epidermal Turnover slows down:

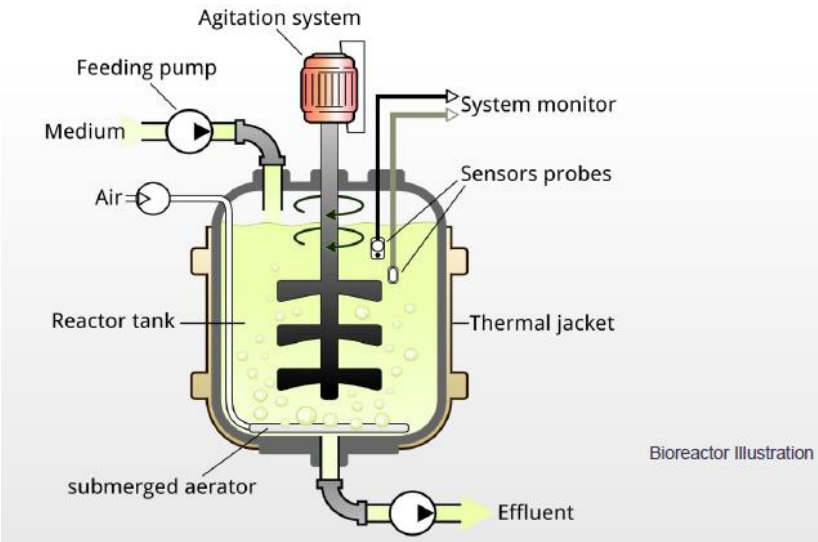
- Turnover of stratum corneum normally takes around four weeks but can require up to six weeks for individuals in their 30's and older.
- Aged skin tends to suffer from severe dryness, roughness and scaling, and is prone to winter eczema.

- It has been proven that water and pH play a significant role in the activity of our skin's natural desquamating enzymes.
- It is well-established that enhanced skin desquamation is the key to accelerating its renewal.



Biofermentation derived active:

- The Oligopeptide in Biofermented Yeast and Soy Amino Acid Complex was developed from a program that screened thousands of molecules for binding affinity for Stratum Corneum Chymotryptic Enzyme (SCCE, also known as KLK7) using Phage Display technology.
- Biofermented Yeast and Soy Amino Acid Complex is produced through biofermentation using a proprietary strain of yeast.



- A proprietary strain of *Saccharomyces cerevisiae* is grown in a medium based on amino acids and specific carbohydrates in order to obtain a very pure yeast culture.
- Careful control and monitoring of a two-week long fermentation process is required.
- The Oligopeptide is expelled from the yeast cells (no lysis is needed).
- The Oligopeptide is enriched and concentrated by separation, filtration and purification.
- The active is formulated in an aqueous vehicle, stabilised and preserved.

Clinical Efficacy (I) Exfoliation Activity:

- The volar forearms of five volunteers were shaved and four defined areas were treated with four successive applications of 5% DHA.
- For three consecutive days, the stained spots were treated once a day by application of 200µL of either:
    - 3% Biofermented Yeast and Soy Amino Acid Complex for 1 hour
    - A leading commercially available enzyme-chemical peel for 10 minutes

  - Or an 8% glycolic acid peel (pH 2.5) for 10 minutes.
- Following treatment, the skin was rinsed with water.
- Prior to the treatment and every 24 hours thereafter, skin colour was measured with both a flatbed scanner and a Chroma Meter. Pictures were taken prior to application and after 1, 2 and 3 days of treatment.

- Chromametry:

A Minolta Chroma Meter was used to measure skin colour in terms of the L*a*b colour space parameters.

L* (Lightness or Luminance) categorizes relative brightness from total black (L* = 0) to total white (L* = 100).

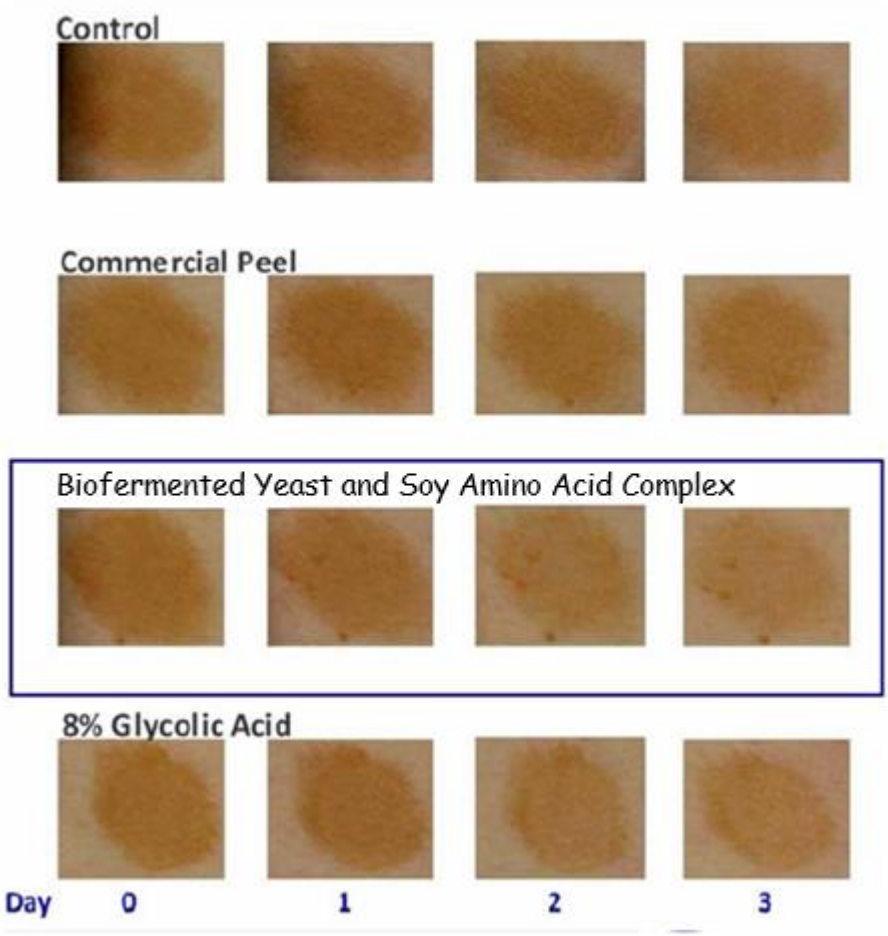
An increase in L* value means that the skin is being lightened.

- Pixel intensity:

Images also were analysed with a flat-bed scanner to determine a mean grey scale value for the pixels within each treatment spot.

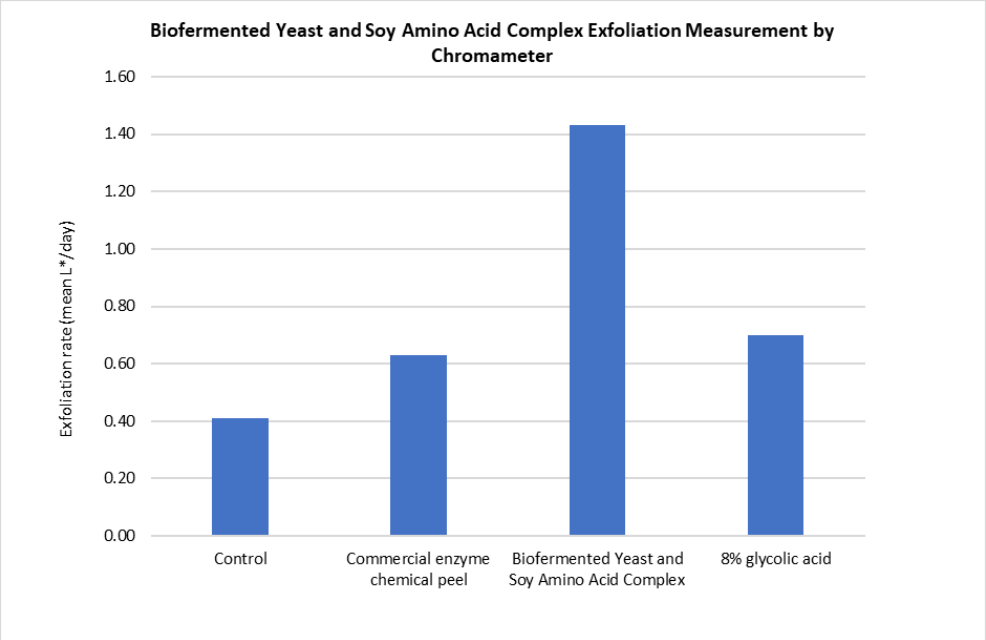
An increase in the rate at which the mean grey scale value decreases (equivalent to a decrease of pixel intensity) is presented as an increase in exfoliation rate.

- Examination of the skin images immediately shows that the best exfoliating activity was achieved by 8% Glycolic acid and Yeast Extract (bio-fermented), Soy Amino.
- Unlike AHA's, Biofermented Yeast and Soy Amino Acid Complex proves to be an efficient exfoliator through a selective and gentle mechanism of action.
- By helping eliminate old/flaky skin, Biofermented Yeast and Soy



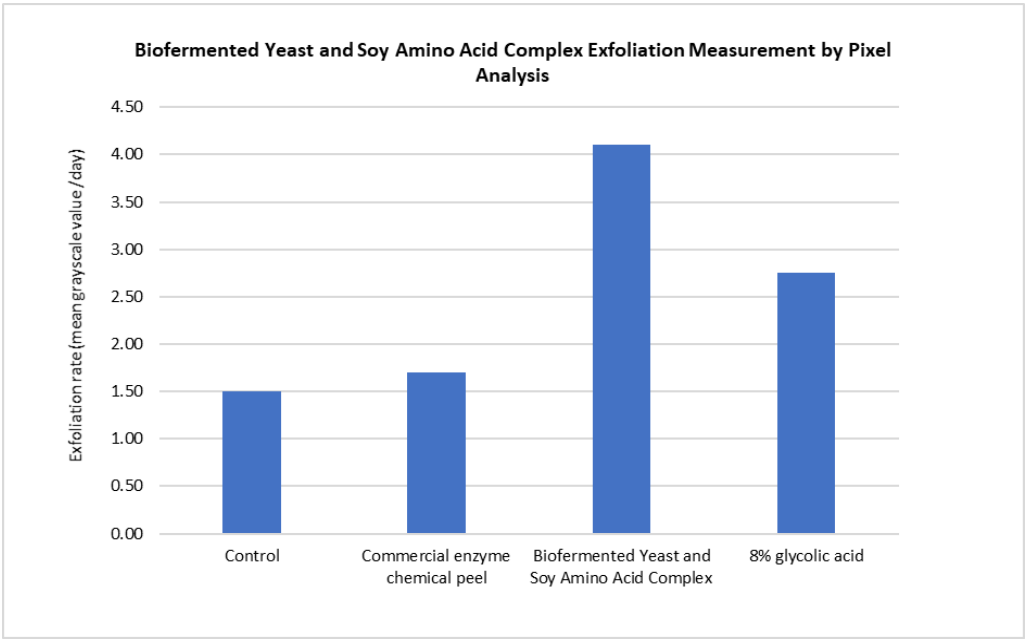
Amino Acid Complex efficiently stimulates stratum corneum turnover and cell renewal processes.

Chromametry, L* results:



Biofermented Yeast and Soy Amino Acid Complex treatment was the most efficient for increasing skin Lightness (L* value)

Flat-bed scanning results:



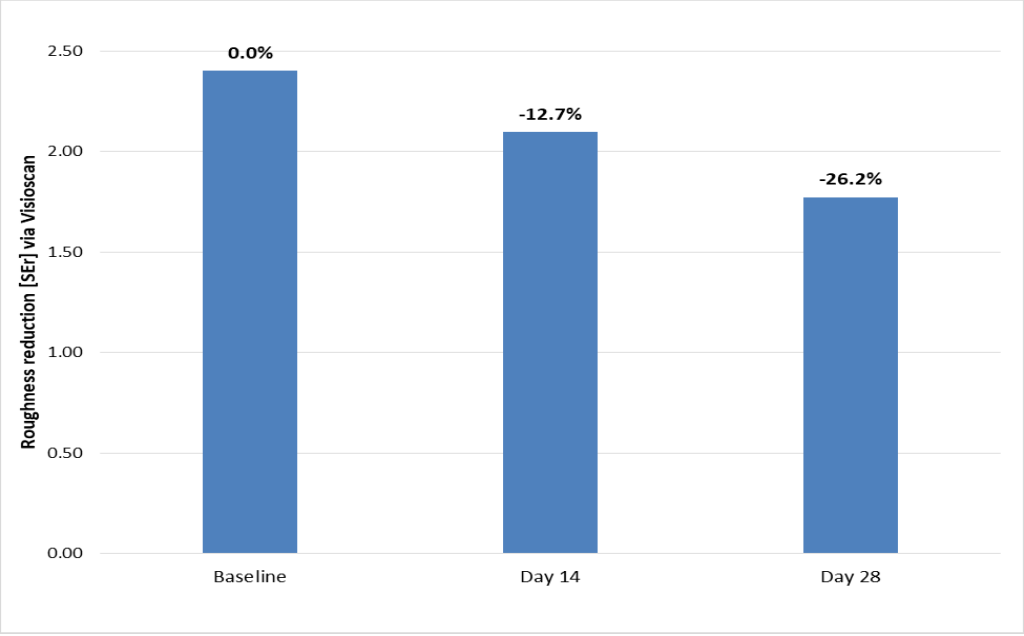
After three applications Biofermented Yeast and Soy Amino Acid Complex shows higher exfoliating efficacy than 8% Glycolic acid.

Clinical Efficacy (II): Data obtained from an independent efficacy study conducted at AMA Laboratories, Inc, in New York City, NY.

- 15 healthy female volunteers (age range 41-55 years) applied a basic O/W cream containing 4% Biofermented Yeast and Soy Amino Acid Complex in the whole face area twice a day.
- Three different parameters were tested prior to application and after 14 and 28 days of use of the cream containing Biofermented Yeast and Soy Amino Acid Complex:
    1. Skin roughness (fine lines/wrinkles) reduction. (SEr parameter via Visioscan).
    2. Skin brightening activity (Lightness, L* via Minolta Chromameter).
    3. Skin elasticity improvements (R7 parameter via Cutometer).
- All data obtained after 14 and 28 days of use of the cream containing Biofermented Yeast and Soy Amino Acid Complex reflected statistically significant improvements from baseline.
- No adverse effects or unexpected reactions of any kind were observed on any of the subjects.

Clinical Efficacy (IIa) Skin Roughness:

- The Visioscan (Courage and Khazaka) takes a direct image of the living skin using a measuring head containing a CCD-camera and two metal halogen lamps positioned opposite each other in order to ensure even illumination of the measuring field.
- The evaluation method SELS (Surface Evaluation of the Living Skin) analyses grey level distribution and allows the calculation of different clinical parameters to quantitatively describe the skin surface as an index.
- Visioscan software automatically calculates the Skin Roughness parameter (SEr).
- Decrease of Skin Roughness (SEr) can be considered as a sign of reduction of fine lines/wrinkles and/or as an improvement of the skin's desquamation process.

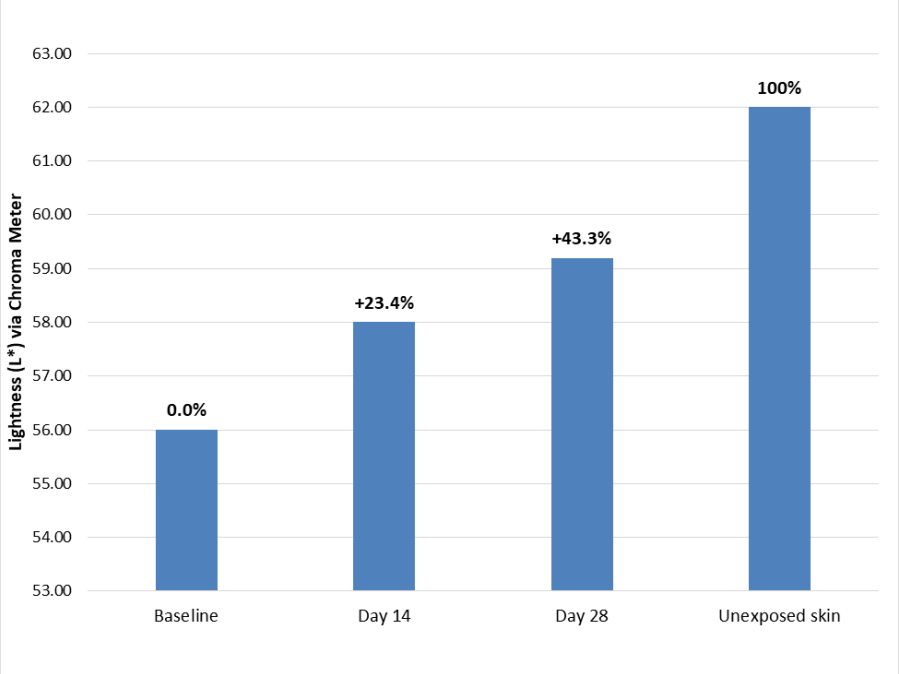


Roughness reduction (SEr) via Visioscan		
Study time point:	**Day 14**	**Day 28**
Mean % Improvement	-12.7%*	-26.2%
Max % Improvement	-26.7%	-40.8%

Clinical Efficacy (IIb) Skin Brightening:

- A Minolta CR-200 Chroma Meter was used to measure skin colour in terms of the L*a*b* colour space parameters.
- L* (lightness parameter) categorises relative brightness from total black (L*=0) to total white (L* = 100).
- An increase in L* value means that the skin is being lightened.
- The data reflect changes in skin colour where test site Baseline readings are considered 0% and the lightest *Unexposed Skin colour of each panellist is considered 100%.
- Unexposed Skin is defined as natural, untanned skin tone/colour for each individual.

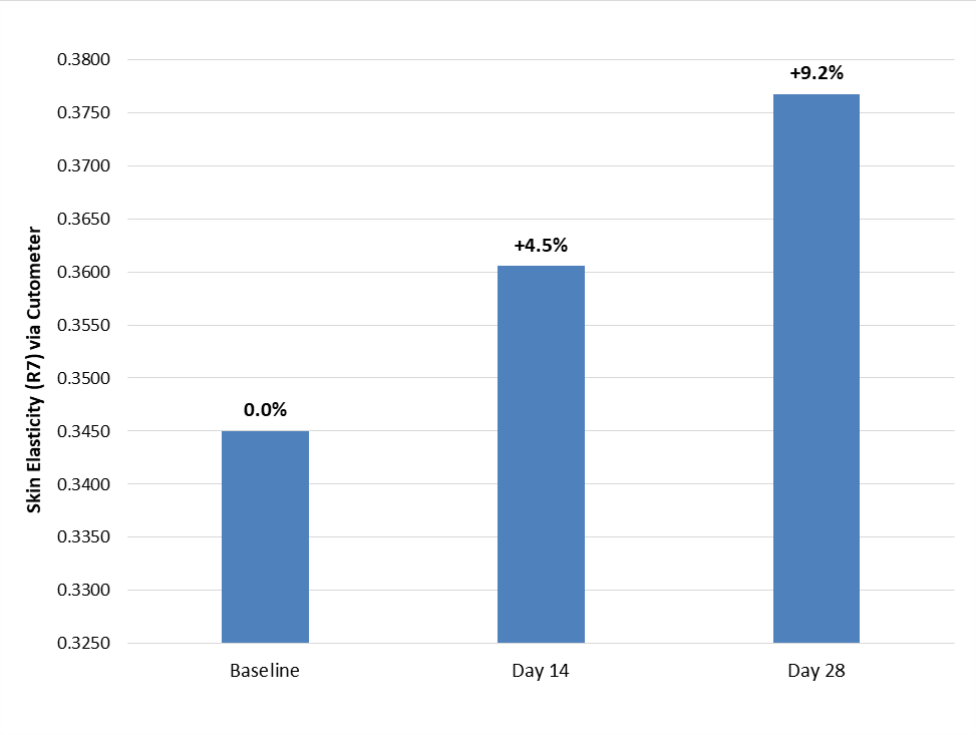
Lightness (L*) via Chroma Meter



Skin Colour Brightness/Lightness Data (L*) via Chroma Meter		
Study time point:	**Day 14**	**Day 28**
Mean % Improvement	23.4%*	43.3%
Max % Improvement	61.1%	86.5%

Clinical Efficacy (IIc) Skin Elasticity:

- A Cutometer SEM 5757 (model 575 Courage and Khazaka) was used to measure skin viscoelastic properties.
- The measuring principle is based on a suction method. Negative pressure is created in the device, which can be regulated between 20 and 500mbar.
- Skin is drawn into a calibrated aperture of the robe by negative pressure where skin penetration depth is determined by a non-contact optical measuring system.
- The R7 elasticity parameter represents the degree of rapid recovery from the maximum skin deformation reached – values range between 0 (no recovery/elasticity) and 1 (maximum recovery/elasticity).



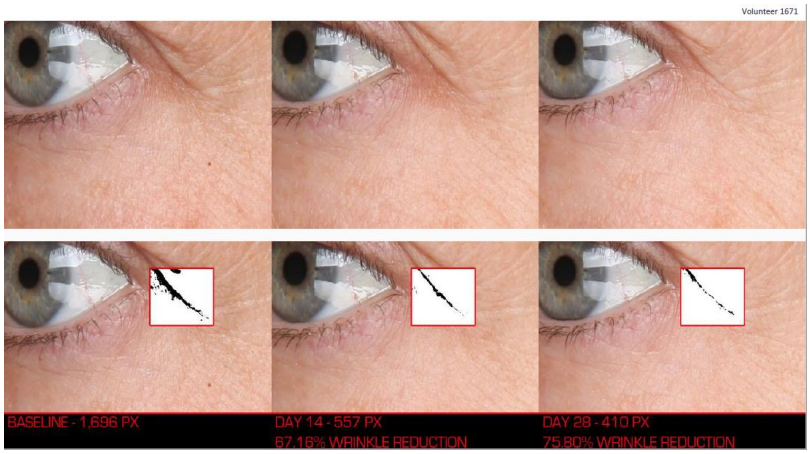
Skin Elasticity (R7) via Cutometer		
Study time point:	**Day 14**	**Day 28**
Mean % Improvement	4.5%*	9.2%
Max % Improvement	19.7%	27.2%

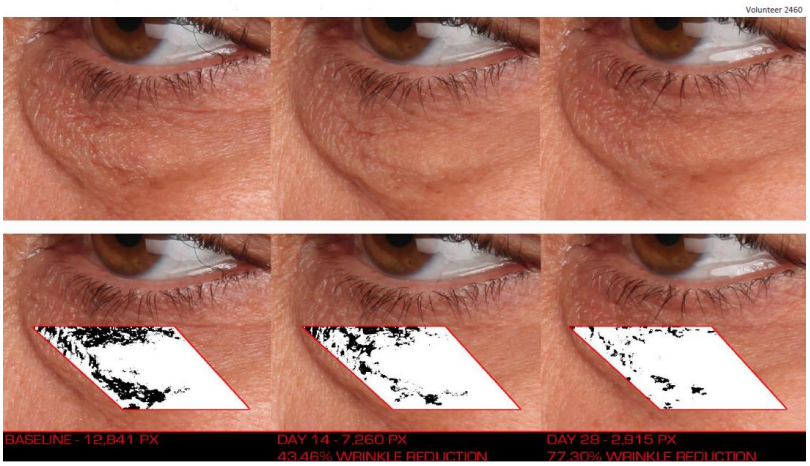
Clinical Efficacy (III) Photographic study (Data obtained from an independent efficacy study conducted at AMA Laboratories, IN, in New York City, NY).

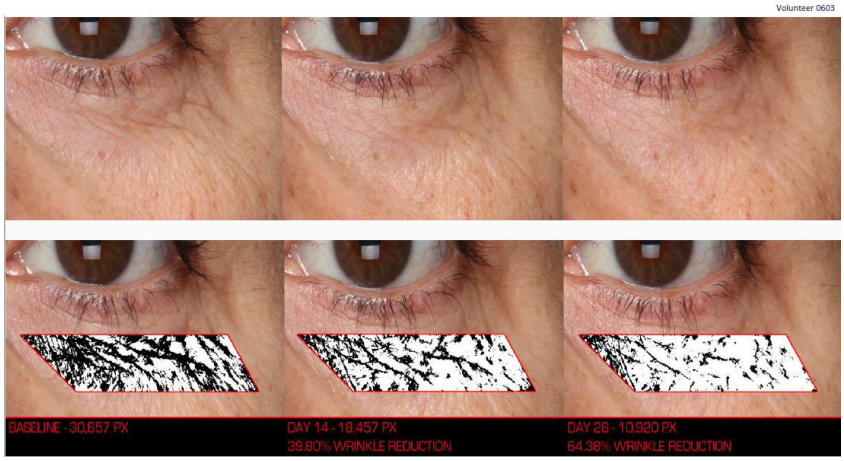
- 5 healthy female volunteers (age range 41-55 years) applied a basic O/W cream containing 4% Biofermented Yeast and Soy Amino Acid Complex on the whole face area twice a day.

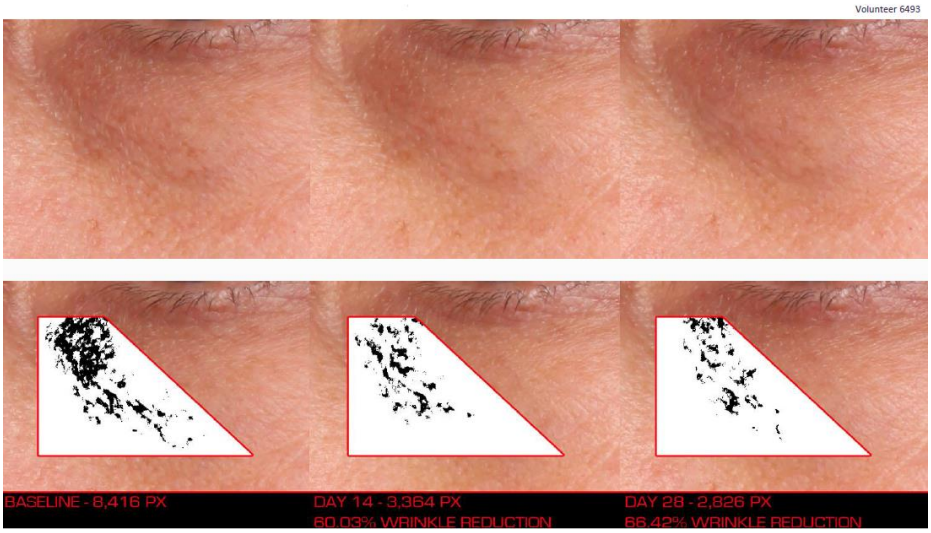
- High resolution before and after digital photographs (certified unretouched) were taken using standardised background/angles, camera settings, lighting, panellist positioning, colour bars and white balance.
- Pictures were taken prior to application (baseline) and after 14 and 28 days of use.
- As shown in the photographs, image analysis methods were used to define the wrinkle area of involvement within the test area at each time point.

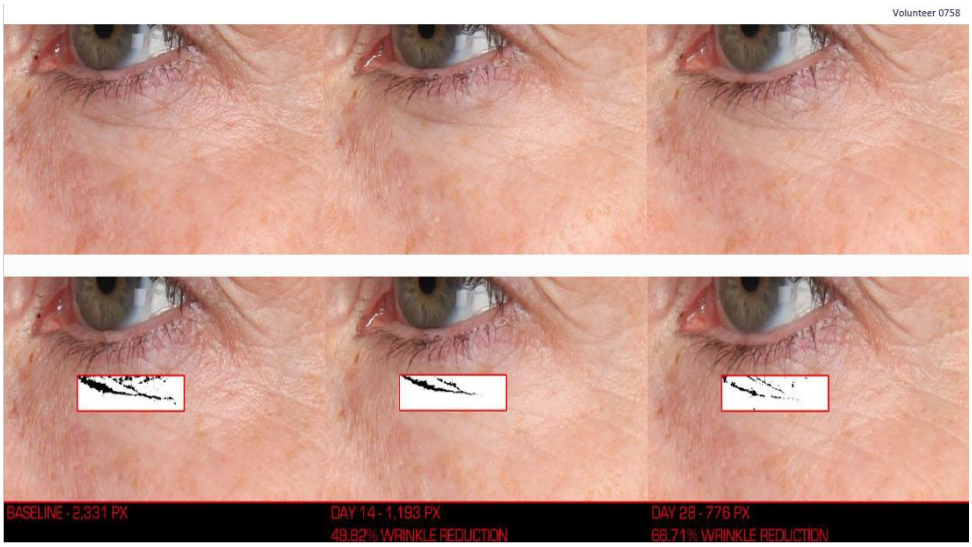
Clinical Efficacy (III) Photographic study. Anti-wrinkle activity:



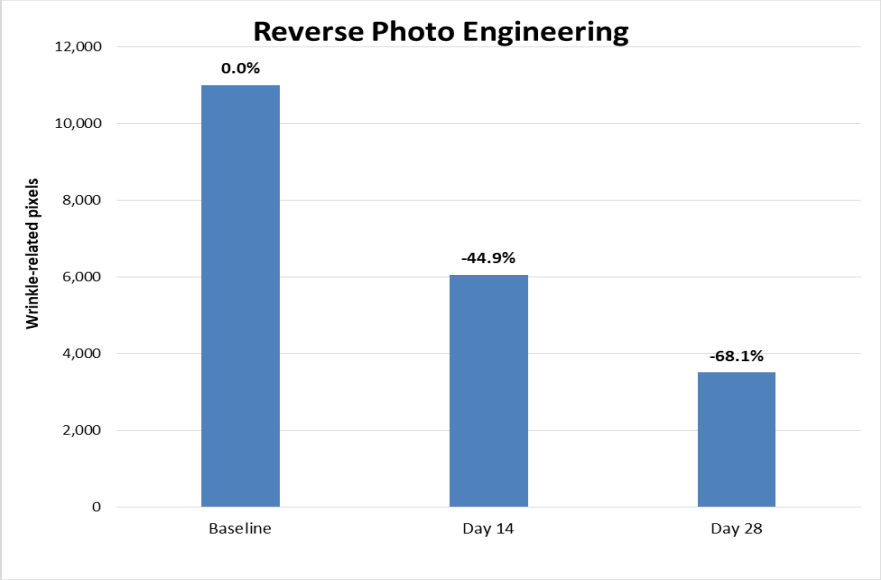




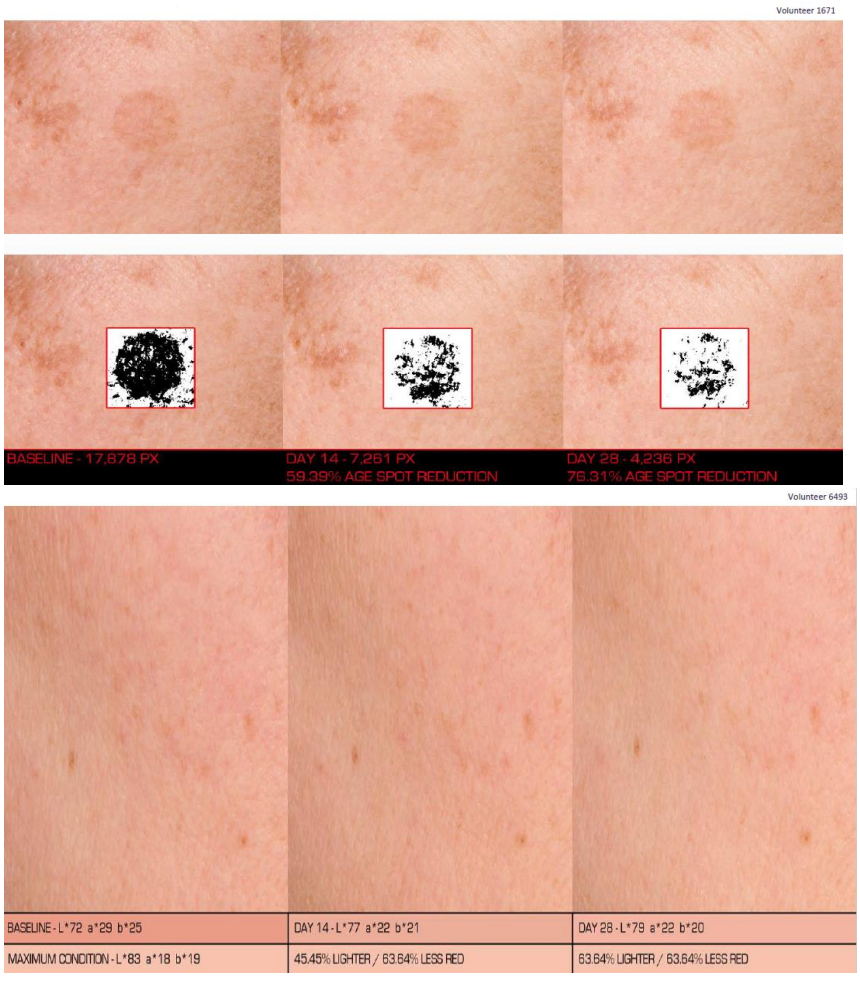




- Significant anti-wrinkle activity was visually detectable in all 5 volunteers who used the cream containing 4% Biofermented Yeast and Soy Amino Acid Complex.
- Image analysis methods were used in order to quantify the wrinkle area of involvement within the test area at each time point.
- Change in the wrinkle area of involvement for each panellist was calculated at each time point as a percent of baseline, and then these percentages were averaged for all panellists at each time point.
- Biofermented Yeast and Soy Amino Acid Complex showed strong anti-wrinkle efficacy after 14 and 28 days on all 5 volunteers corroborating the results obtained via Visioscan (SEr).



Clinical Efficacy (III) Photographic study. Skin brightening:



Conclusions:

- Biofermented Yeast and Soy Amino Acid Complex contains an Oligopeptide, discovered through state-of-the-art phage technology that enhances Stratum Corneum Chymotrypic Enzyme (SCCE) activity.
- Biofermented Yeast and Soy Amino Acid Complex is produced via bio-fermentation in a technically complex process using a proprietary strain of yeast.
- It selectively targets mechanisms of adhesion of corneocytes in order to facilitate their removal. By helping eliminate old/flaky skin, Biofermented Yeast and Soy Amino Acid Complex efficiently stimulates stratum corneum turnover and cell renewal.
- Its gentle mechanism of action and impeccable safety profile make Biofermented Yeast and Soy Amino Acid Complex an ideal candidate to be used in leave-on anti-ageing formulations for a uniform, smooth and radiant skin texture.
- Biofermented Yeast and Soy Amino Acid Complex is very suitable for use in skin brightening and also in acne products.