AC Dermal Respiratory Factor Advanced PF

Increases Cell Respiration + Collagen & Elastin Synthesis + Enhances Cell Metabolism

Anti-Aging Technology Using *Saccharomyces cerevisiae*
AC Dermal Respiratory Factor Advanced PF

**Technical Information:**

**Product Code:** 20219PF

**INCI Name:** Water + Saccharomyces Lysate Extract

**INCI Status:** Conforms

**Suggested Use Levels:** 0.5 – 1.0%

**Suggested Applications:** Increases Cellular Respiration + Enhances Cellular Metabolism + Collagen/ Elastin Synthesis + Anti-Aging

**Solubility:** Water Soluble
Saccharomyces cerevisiae

- *Saccharomyces cerevisiae* live yeast cells are struck with specific wave lengths of UV radiation
  - Prompts live yeast cells to secrete active compound
  - Biofermentation and various filtration techniques are used to then isolate and extract the live yeast secretion
- Non-Animal Derived + Non-Dairy
- Secretion produced from the most well-known yeast
  - Baker’s Yeast/ Brewer’s Yeast
Product Benefits:

- Increases cellular respiration
- Increases cellular proliferation
- Enhances cellular metabolism
- Promotes collagen + elastin synthesis
- Extraordinary skin soothing properties

Ideal for use in baby care, after sun care, sensitive skin, scalp care applications and to provide potent anti-aging benefits
Live Yeast Cell Derivatives (LYCD)

LYCD

- Commercial use began in the American Home Product’s market
  - LYCD was the main active in an anti-haemorrhoid cream – Prep H
- Adventurous fashion models can be thanked for the crossover of LYCD into cosmetic applications for soothing
  - Sleep deprivation caused bags under the eyes
  - Models used this LYCD containing cream to reduce the appearance of bags and swelling

In North America + South America + Europe LYCD is primarily a cosmetic potentiater:
- Stimulates Oxygen Consumption
- Combats Irritation
Reduces Irritation: Mechanism of Action

Live Yeast Cell Derivatives

- LYCD’s role in irritation reduction became clearer with a more focused study of Heat Shock Proteins (HSP)

- When cells are subjected to stress, proteins are produced to:
  - Duplicate the functions of disabled cell
  - Protect the cell against additional stress

- HSPs are a component of LYCD – these specific Heat Shock Proteins are similar to human cells & can be applied to help reduce or reverse the actual stress in human cells
Potentiation of Activity

Live Yeast Cell Derivatives

- LYCD is a global metabolic stimulant
- Capable of potentiating the activity of other materials in a cosmetic/personal care formulation
- LYCD utility is evidenced in Avon’s patents US 5,676,956 and US 5,643,587 where it’s used to increase the activity of Vitamin C derivatives
**Yeast Species**

*Saccharomyces cerevisiae*

- Fermentation abilities
- Very similar to human cells in composition and structure
  - True eukaryote
  - Only 17 chromosomes (humans have 23) but structurally similar
  - Two genders, reproduces with cells (similar to human cell fertilization)
- First organism to have a completely mapped genome
- Egyptians are thought to have discovered the beneficial properties of yeast:
  - Over 6,000 years ago
  - Leavened breads, wine and beer
Discovering Fermentation

• Said that yeast cells found their way to an open barrel of crushed grapes and the barrel contents turned into wine!
  ★ Residual yeast sediment was then added to subsequent grape barrels
  ★ Wine production process born!

• In the 1850’s, Louis Pasteur discovered that fermentation was simply the metabolic by-product of yeast

• In 1896, German chemist Eduard Buchner discovered that fermentation enzymes in yeast remained active even after cell extraction – this paved the way for the delineation of biochemical process of fermentation
Yeast + Biofermentation

Dr. George Sperti

- 1930’s – Performed research using UV radiation and yeast cells
- Live yeast cells were injured with UV radiation and secretions from the cells were collected
- His findings and methods of LYCD production were immortalized in three patents!
- Discoveries after secretion extraction was added to normal cells:
  - Significant Increase in Cellular Respiration + Increase in Cellular Replication + Enhanced Glycolysis + Enhanced Cellular Metabolism

★ Isolated LYCD were shown to stimulate cells from other eukaryotes ★
**AC Dermal Respiratory Factor Advanced PF Efficacy Test Results**

### In-vivo Sensorial Soothing Assay

#### Protocol

- Evaluate the ability of AC Dermal Respiratory Factor Advanced PF to reduce the discomfort produced by overexposure to UV radiation.
- 20 panelists (m/f) evaluated two lotions containing either AC DFR Advanced PF (2.8% w/w) or Benzocaine (0.5% w/w).
- Panelists applied lotions immediately after sun exposure.
- Recorded initial soothing perception and perception after 2 hours (1 to 5 with 5 being complete reduction in pain).

Topical application of **AC Dermal Respiratory Factor Advanced PF** is capable of producing consumer **perceivable reduction** in both **erythema** and pain caused due to **overexposure to UV light**.
AC Dermal Respiratory Factor Advanced PF
Efficacy Test Results

**In-vitro Collagen Production Assay**

- **Protocol**
  - Collagen is a major component of the dermis & provides structure & elasticity to the skin
  - Three dose levels were compared to the control – .01%, .1% & 1%
  - Results were determined by the ELISA Assay
  - According to the results, all concentrations of **AC Dermal Respiratory Factor Advanced PF** was effective at increasing collagen synthesis

![Graph showing percent increase in collagen production](attachment:image.png)

**Figure 2.** Increase in collagen production following application of **AC Dermal Respiratory Factor Advanced PF**.
AC Dermal Respiratory Factor Advanced PF
Efficacy Test Results

Procollagen Assay

Protocol

• An ELISA assay was used to assess AC DRF Advanced impact on collagen synthesis

• The results indicate that AC DRF Advanced PF is capable of increasing the expression of type 1-C Peptide in a fibroblast cell culture model

• Useful in cosmetic formulations intended to increase collagen synthesis

Figure 3. Comparison of the effects on procollagen levels following treatment.
AC Dermal Respiratory Factor Advanced PF
Efficacy Test Results

**ORAC Assay**

![Graph showing antioxidant capacity results]

**Protocol**
- Trolox is used as the positive control.
- Solutions were prepared at two concentrations for a reference.
- Fluorescent measurements were taken every 2 minutes for 2 hours.
- AC Dermal Respiratory Factor Advanced PF showed antioxidant activity at all concentrations tested.

**Figure 4.** Results of antioxidant capacity of test materials.
AC Dermal Respiratory Factor Advanced PF Efficacy Test Results

Pigmentation Assay

**Protocol**

- **Equipment:** DermaLab Skin Combo
- 10 volunteers M/F between the ages of 23 and 45
- Measure the erythema levels of the subject’s volar forearms
- Baseline pigmentation readings were taken on day one of the study
- **AC Dermal Respiratory Factor Advanced PF** is capable of decreasing erythema when compared to both the untreated control as well as the base lotion

![Erythema Average Results for Individual Test Sites](image)

*Figure 5. Pigmentation Results for Individual Test Sites.*
AC Dermal Respiratory Factor Advanced PF Efficacy Test Results

Pigmentation Assay

<table>
<thead>
<tr>
<th>Percent (%) Difference</th>
<th>T = 0</th>
<th>T = 1 Week</th>
<th>T = 2 Weeks</th>
<th>T = 3 Weeks</th>
<th>T = 4 Weeks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline Lotion vs. Untreated</td>
<td></td>
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<tr>
<td>Experimental (2.0% AC DRF Advanced PF + Base Lotion) vs. Untreated</td>
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<tr>
<td>Experimental (2.0% AC DRF Advanced PF + Base Lotion) vs. Base Lotion</td>
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</tbody>
</table>

**Figure 6.** Pigmentation Results Compared in Percent Difference between Test Sites.

**Protocol**

- Equipment: DermaLab Skin Combo
- 10 volunteers M/F between the ages of 23 and 45
- Measure the erythema levels of the subject’s volar forearms
- Baseline pigmentation readings were taken on day one of the study
- **AC Dermal Respiratory Factor Advance PF** showed reductions in erythema at a 2.0% concentration
High Resolution Ultrasound Skin Imaging Assay

**Protocol**
- Equipment: DermaLab Skin Combo
- 10 volunteers M/F between the ages of 23 and 45
- Determine the skin density of the subject’s volar forearms
- Apply 2 mg of each test material on their volar forearms
- Concentration: 2%
- **AC Dermal Respiratory Factor Advanced PF** is capable of improving skin density when compared to both the untreated control as well as the base lotion

**Figure 7.** Ultrasound Results Comparing Test Sites to Untreated Site.
AC Dermal Respiratory Factor Advanced PF
Efficacy Test Results

Hyaluronic Synthesis Assay

**Protocol**

- *In-vitro* Hyaluronic Acid Synthesis was performed using human keratinocytes.
- Cultured in KSFM medium and incubated for a period of 24 hours at a temperature of 37°C with the concentration of carbon dioxide in the incubator being limited to 5%.
- Concentrations: 0.5%, 1.0%.
- Incubated under the same conditions as before for a period of 72 hours.
- **AC Dermal Respiratory Factor Advanced PF** is capable of increasing the percent concentration of hyaluronic acid by approximately 42% in comparison to the control.

*Figure 8.* Hyaluronic Acid Production comparing **AC Dermal Respiratory Factor Advanced PF** and Control.
AC Dermal Respiratory Factor Advanced PF Efficacy Test Results

Cellular Viability Assay Analysis

**Protocol**

- Human dermal fibroblasts were seeded into 96-well tissue culture plates.
- Concentrations: 0.1%, 0.01%
- AC Dermal Respiratory Factor Advanced PF, nor the preservatives exhibited any inhibition of cell viability.
- It can therefore be concluded that at normal use concentrations AC Dermal Respiratory Factor Advanced PF is not cytotoxic.

**Figure 9.** Cellular Metabolism of AC Dermal Respiratory Factor Advanced PF-treated fibroblasts expressed in terms of percent of control.
AC Dermal Respiratory Factor Advanced PF Efficacy Test Results

Moisturization Assay

Average Moisture Readings

Figure 10. Average increase in moisturization per test site.

**Protocol**

- Equipment: DermaLab Skin Combo
- 10 volunteers M/F between the ages of 23 and 45
- Apply on volar forearms
- Moisture levels were improved by 44.60% after 24 hours and by 95.0% after 4 weeks when compared to the untreated control
- When compared to the base cream, AC DRF Advanced PF improved moisturization by 33.74% after 4 weeks
AC Dermal Respiratory Factor Advanced PF Efficacy Test Results

Moisturization Assay

Percent (%) Difference

![Graph showing percent difference in moisturization between test sites over four weeks.](graph.png)

**Protocol**

- **Equipment:** DermaLab Skin Combo
- 10 volunteers M/F between the ages of 23 and 45
- Apply on volar forearms
- **2.0% AC DRF Advanced PF + Base Lotion** moisturized the skin 19.76% better after 24 hours and was still 9.01% more effective in moisturizing the skin when readings were taken one week after the applications of both test materials ceased

*Figure 11.* Percent difference in moisturization between two test sites over four weeks.

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Moisturization Assay

**Protocol**
- **Equipment:** DermaLab Skin Combo
- 10 volunteers M/F between the ages of 23 and 45
- Apply on volar forearms
- AC Dermal Respiratory Factor Advanced PF is not only capable of providing functional benefits but it is also capable of providing moisturizing and skin hydrating benefits when added to cosmetic applications

**Figure 12.** Regression in skin moisturization after application of experimental material ceased.
AC Dermal Respiratory Factor Advanced PF
Efficacy Test Results

**TEWL Assay**

![Average Moisture Loss Readings](chart)

**Protocol**
- **Equipment:** DermaLab Skin Combo
- 10 volunteers M/F between the ages of 23 and 45
- Measure TEWL on the subject’s volar forearms; apply 2 mg of each test material
- **AC Dermal Respiratory Factor Advanced PF** showed very effective moisture retention capabilities at a 2.0% concentration

*Figure 13.* TEWL measurements taken at individual test sites
AC Dermal Respiratory Factor Advanced PF Efficacy Test Results

TEWL Assay

**Protocol**

- **Equipment:** DermaLab Skin Combo
- 10 volunteers M/F between the ages of 23 and 45
- Measure TEWL on the subject’s volar forearms; apply 2 mg of each test material
- When compared to the base cream, **AC Dermal Respiratory Factor Advanced PF** was shown to decrease transepidermal water loss by 29.24% and by 50.00% when compared to the untreated control after 4 weeks
- Promotes moisture retention benefits when added to cosmetic applications

**Figure 14.** Comparison of percent reduction in water loss over time between two test sites.
**AC Dermal Respiratory Factor Advanced PF Efficacy Test Results**

**In-vitro Scratch Assay**

**Protocol**
- Human dermal fibroblasts were seeded into 6-well tissue culture plates
- 5% concentration of **AC Dermal Respiratory Factor Advanced PF** was added to the serum-free DMEM and incubated with fibroblasts
- Scratch took place every 24 hours and up to 96 hours
- **AC Dermal Respiratory Factor Advanced PF** was able to increase cell migration and close the scratch at a rate comparable to the positive control
- Product has healing abilities and cell proliferation properties
AC Dermal Respiratory Factor Advanced PF

**Additional Data**

- **Dermal and Ocular Irritation Tests:** Non-Irritating
AC Dermal Respiratory Factor Advanced PF

Technical Information:

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INCI Status: Conforms

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Suggested Applications: Increases Cellular Respiration + Enhances Cellular Metabolism + Collagen/ Elastin Synthesis + Anti-Aging

Solubility: Water Soluble
AC Dermal Respiratory Factor Advanced PF

THANK YOU

For more information – Visit our website!
www.activeconceptsllc.com