<table>
<thead>
<tr>
<th>List</th>
<th>INCI name</th>
<th>Function</th>
<th>Form</th>
<th>Point of Interest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fermentoil Olive Argan Green tea seed</td>
<td>Pseudozyma / Olive oil ferment extract, Pseudozyma / Argan oil ferment extract, Pseudozyma / Green tea seed oil ferment extract</td>
<td>Non-greasy Feeling, Improved Skin Absorption, Improved Emulsifying Compatibility, Nutritive</td>
<td>Liquid</td>
<td>Fermentoil to give nutritional values and improved feeling, absorption and compatibility for usage through the microbial fermentation system</td>
</tr>
<tr>
<td>B9-Vitapol</td>
<td>Butylene Glycol, 1,2-hexanediol, Bacillus/soybean/folic acid ferment extract, Sodium hyaluronate</td>
<td>Anti-wrinkle, Anti-allergy, Anti-porphyrin, Resistance UV, Moisturizing</td>
<td>Liquid</td>
<td>Vitamin B9 (Folic acid), Now you can apply on skin Reformulated form of folic acid through the structural changes by microbial fermentation system</td>
</tr>
<tr>
<td>BIO-Placenta</td>
<td>Lecithin, Butylene glycol, Glycerin, Polysorbate 20, Sodium ascorbyl phosphate, Bacillus/soybean/folic acid ferment extract, Acetyl glutamine, rh(sh)-oligopeptide-1, rh(sh)-oligopeptide-2, rh(sh)-polypeptide-1, rh(sh)-polypeptide-9, rh(sh)-polypeptide-11</td>
<td>Anti-wrinkle, Skin rejuvenation, Elasticity enhance, Nutritional supplement, Cell vitalization</td>
<td>Liquid</td>
<td>Pseudo-placenta with synergic effects and safety These growth factors are safely originated from microbial fermentation</td>
</tr>
<tr>
<td>Hydracell Q</td>
<td>Acetyl glutamine</td>
<td>Anti-stress, Moisturizing, Biosynthesis of collagen, Cell activation, Cell growth stimulation</td>
<td>Powder</td>
<td>Provides water into the cells through transport channel and prevents the skin from an oxidative stress</td>
</tr>
<tr>
<td>Sigmedia</td>
<td>Lecithin, Butylene glycol, Polysorbate 20, Sodium ascorbyl phosphate, Phytosphingosine phosphate</td>
<td>Anti-aging, Anti-wrinkle, Skin rejuvenation, Cell vitalization</td>
<td>Liquid</td>
<td>The liposome type of Phytosphingosine-1-Phosphate Similar structure to Sphingosine-1-Phosphate</td>
</tr>
<tr>
<td>EDE-cide plus</td>
<td>Octanediol, Ethylhexyl glycerin, Grapefruit seed extract, Artemisia princeps extract</td>
<td>Nature friendly, Anti-bacterial, Paraben free</td>
<td>Liquid</td>
<td>A drop of powerful and nature-friendly EDE-cide plus prevents bacterial growth</td>
</tr>
</tbody>
</table>
**B₉-Vitapol**  
Anti-wrinkle, Anti-allergy

**INCI**  
Butylene glycol, 1,2-Hexanediol,  
*Bacillus/soybean/folic acid ferment extract*, Sodium hyaluronate

**B₉-Vitapol** is reformulated form of folic acid through the structural changes by microbial fermentation system.

**This technology** is patented in Korea and pending in PCT

**Properties**  
- Anti-wrinkle through cell growth stimulation  
- Anti-allergy  
- Anti-porphyrin  
- Resistance against UV  
- Moisturizing

**Recommended dosages**  
- 3.0~5.0%

---

**Vitamin B₉(Folic acid), NOW you can apply on skin**

#308, Byucksan Digital Valley 2-cha, 481-10, Gasan-gong, Geumcheon-gu, SEOUL 153-783 KOREA  
Tel : +82-2-2113-0500  
Fax : +82-2-2113-0505  
e-mail: damy@damychem.com  
www.damychem.com
**Fermentation?**

**TOP 5 Healthiest Food in the world**

In 2006, the food magazine ‘Health’ selected world’s top 5 foods. Among those 5 foods, 4 of the foods were fermented foods.

![Kimchi(Korea)](image1) ![Yogurt(Greece)](image2) ![Lentil(India)](image3) ![Natto(Japan)](image4)

---

**Reduction of eye-wrinkle**

- *in vivo* test, 10 volunteers
- Lotion containing 5% of B9-Vitapol twice a day for 4 weeks
- Detection method: Facial Analysis System

![3-D Simulation](image5)

Reduces wrinkles by 30% in 4 weeks with B9-Vitapol

---

**Anti-allergy**

Reduction of releasing histamine from mast cell and leukocyte

- Degranulation assay (*in vitro*)
- Observation of anti-histamine on human leukocyte
- Inhibition assay of histamine release (*in vitro*)
- Allergic response assay (*in vivo*)

![Before use][After use](image6)

Provides similar effect as Cromolyn on allergic reactions

---

**Limitations of Vitamin B9**

- Naturally fermented sugar and fructose increase moisturizing effect.
- Boost of collagen from activation of glycine and amino acids.
- Fermented extracts rejuvenate, moisturize and activate cells on skin.

- Sensitive to pH change
- Low solubility
- Hard to apply to various formulation in cosmetics because of pteolyl group.

![Pteroyl group](image7)

---

**Anti-porphyrin**

- *in vivo* test, 10 volunteers
- Lotion containing 5% of B9-Vitapol twice a day for 4 weeks
- Detection method: Facial Analysis System

![Before use][After use](image8)

Reduces porphyrin(pimple causing) by 83% with B9-Vitapol

---

**Effect of Fermentation on the Skin**

- Naturally fermented sugar and fructose increase moisturizing effect.
- Boost of collagen from activation of glycine and amino acids.
- Fermented extracts rejuvenate, moisturize and activate cells on skin.
**BIO-Placenta**

**Anti-aging, Skin rejuvenation**

### INCI

Lecithin, Butylene glycol, Glycerin, Polysorbate 20, Sodium ascorbyl phosphate, Bacillus/soybean/folic acid ferment extract, Acetyl glutamine, rh(sh)-oligopeptide-1, rh(sh)-oligopeptide-2, rh(sh)-polypeptide-1, rh(sh)-polypeptide-9, rh(sh)-polypeptide-11

**BIO-Placenta** is safely originated from microbial fermentation.

**BIO-Placenta** contains the five growth factors (EGF, IGF-1, acid FGF, basic FGF and VEGF), vitamins (Vitamin B₉) and amino acids (Acetyl glutamin).

**BIO-Placenta** is formed in resemblance to human placenta, for its effects and formation.

### Properties

- Anti-wrinkle
- Skin rejuvenation
- Elasticity enhance
- Nutritional supplement
- Cell vitalization

### Recommended dosages

- 3.0%

**Pseudo-placenta with synergic effects and safety**
Aging is caused by loss of Growth Factors (GF).

Commonly known effects of dermatological efficacy of the placenta are Anti-aging & Skin rejuvenation.

Reference: Placental growth factors, B.V.Rama Sastry, Placental pharmacology, p126–150

Summary of Advantages

**BIO-Placenta VS Human Placenta**
Components of BIO-Placenta are similar to Human Placenta which is based on ‘Placental Pharmacology’.

**Originated in Microbial Fermentation**
Components are safely originated from microbial fermentation.

**Proven to contain Growth Factors**
The inclusion of growth factors can be found by HPLC analysis.

**Synergic Effect**
Combination of 5 growth factors and essential factors make synergic effect on skin.

**Liposome Type**
Maximizes stability and penetration.

**Proven to contain Growth Factors**

Different from commercial human placenta products, the inclusion of growth factors can be found by HPLC analysis.

**Synergic Effect**

Migration assay
Human Epidermal Keratinocyte

<table>
<thead>
<tr>
<th></th>
<th>Control</th>
<th>BIO-Placenta 0.01%</th>
<th>BIO-Placenta 0.1%</th>
</tr>
</thead>
<tbody>
<tr>
<td>0hr</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14hrs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19hrs</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Healthy and active epidermal cells function to supplement the skin nutrients.
- BIO-Placenta, activates cells more efficiently.

Combination of 5 growth factors and essential factors make synergic effect on skin.

**Anti-wrinkle**

Reduction of eye-wrinkle

Reduces wrinkles by 30% in 4 weeks with BIO-Placenta

**Anti-aging Effect**

- Cell: Human Dermal Fibroblasts, Neonatal (LONZA Co. Ltd.)
- Detection method: Cell counting
- BIO-Placenta concentration: 0.1%

BIO-Placenta slows down the passage number (process of aging) while normal aged cells decrease its activation.
Hydracell Q
Cell hydration, Anti-stress

INCI
Acetyl glutamine

Hydracell Q provides water into the cells through transport channel and prevents the skin from an oxidative stress

Hydracell Q is reformulated to improve the stability

Properties
- Anti-stress effect on damaged skin cells from UV and pollution
- Biosynthesis of collagen on skin cells
- Cell activation
- Cell growth stimulation

Recommended dosages
- 1.0~2.0%

Water your skin cells like drinking aqua
**Hydracell Q**  Cell hydration, Anti-stress

**New Solution**
- Dehydration
- Rehydration

**Dehydration**
- **Dry Skin**
- Hydracell Q

**Rehydration**
- **Hydrated Skin**
- Hydracell Q

**Mechanism & Function of Glutamin**

**Stress**
- Glutamin
- Energy Metabolism
- Immune Function
- Swelling
- Anti-stress Effect

**Application to Cosmetics**

**Glutamine**
- Improve Stability

**Hydracell Q**
- The amines in Glutamine are very unstable
- Acetylated amino group

**Improved stability has made it available for use in liquid products**

**Reference:**

**Cell Swelling Mechanism**

When cells shrink, Hydracell Q enters the cells through transport channel and increases the level of K⁺.

**Moisturizing Effect**

- *in vivo* test, 10 volunteers
- Lotion containing 5% of Hydracell Q twice a day for 4 weeks
- Detection method: Microscope observation(X200), after washing

Before

After

Hydracell Q provides sufficient amount of hydration to keep healthy skin

**Anti-stress effect**

**Functions on human skin**

- **Method:** Cell viability assay after 24hr with 0.4mM H₂O₂ treatment
- **Cell strain:** Human Dermal Fibroblast Neonatal(HDFN, LONZA) Assay
- **Method:** NR assay & Trypan Blue staining

0.4mM H₂O₂

0.125% Hydracell Q

0.4mM H₂O₂ + 0.125% Hydracell Q

Hydracell Q prevents from damage caused by oxidative stress through cell swelling
**Sigmedia**

**Anti-aging, Anti-wrinkle**

**INCI**
Lecithin, Butylene glycol, Glycerin, Polysorbate 20, Sodium ascorbyl phosphate, Phytosphingosine phosphate

**Sigmedia** is the liposome type of Phytosphingosine-1-Phosphate(PhS-1-P).
Sigmedia has similar structure to Sphingosine-1-Phosphate(S-1-P) which affects cellular functions: signal transduction for anti-aging and anti-wrinkle.

**Sigmedia** is an innovative substance that shows the effects on skin as S-1-P.

**Sigmedia** is very powerful signaling agent for anti-aging.

**Properties**
- Anti-aging
- Anti-wrinkle
- Skin rejuvenation
- Cell vitalization

**Recommended dosages**
- 3.0%

**Awakening your skin cells through signals**

Damy Chemical

#308, Byucksan Digital Valley 2-cha, 481-10, Gasan-gong, Geumcheon-gu, SEOUL 153-783 KOREA
Tel: +82-2-2113-0500  Fax: +82-2-2113-0505  e-mail: damy@damychem.com  www.damychem.com
**Sigmedia**  Anti-aging, Anti-wrinkle

### S-1-P as Signaling Agent

**Functions**
- **Proliferation** by mitogenic stimulation
- **Differentiation** of keratinocyte
- **Survival** from oxidative damage
- **Wound healing** from releasing S-1-P

### New Solution

**PhS-1-P** ➡️ liposome ➡️ Sigmedia

**Limitations of S-1-P**
- Gets reduced as we age
- Apply to cosmetic as raw material
- Very high in cost
- Low solubility
- Low stability

**Advantage of PhS-1-P**
- Replacement of S-1-P
- Similar structure as S-1-P
- Apply to cosmetic as raw material
- Act as a cell signaling agent for anti-aging
- More stable and soluble than S-1-P
- Safe substance for application

---

**In vivo Assay of anti-wrinkle**
- 10 volunteers
- Lotion containing 3.0% of Sigmedia twice a day for 4 weeks

Reduces fine and deep wrinkles in 4 weeks with Sigmedia

---

**Anti-senescence Assay**

<table>
<thead>
<tr>
<th>Control</th>
<th>Sigmedia 0.01ppm</th>
<th>Sigmedia 0.1ppm</th>
<th>Sigmedia 1ppm</th>
</tr>
</thead>
<tbody>
<tr>
<td>X 10</td>
<td>X 100</td>
<td>X 10</td>
<td>X 100</td>
</tr>
<tr>
<td>P19</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P20</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P21</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P22</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

When Sigmedia is applied, cells show healthier condition regardless of the passage number(aging) of the cell

---

**Migration Assay**

Sigmedia increases the migration of keratinocyte which gives wound healing, anti-wrinkle and rejuvenating effects

---

According to our research, Damy has developed an analogue molecule of S-1-P that are similar in structure and function

www.damychem.com
Going green to preserve your formula

**EDE-cide plus**
Nature friendly, Paraben free

**INCI**
Octanediol, Ethylhexyl glycerin, Grapefruit seed extract, Artemisia princeps extract

**Unique blend** of Artemisia princeps & Grapefruit seed extracts for anti-bacterial activity

**A drop** of powerful and natural EDE-cide plus prevents bacterial growth

**EDE-cide plus is**
- Safe and nature friendly
- Effective in anti-bacterial activity
- Paraben free

**Recommended dosages**
- Skin softener, Toner, Essence: 0.4%
- Lotion, Cream, Emulsion: 0.6%
Powerful Anti-biotic Effect Composition

EDE-cide plus is made by hydrophilic & lipophilic process to increase safety and effects.

The essential oil of Korean Artemisia has high anti-bacterial activities.

Essential oil value

Among 3 well known Korean Artemisia plants, Artemisia princeps have the highest essential oil value.

MIC (Minimum Inhibitory Concentration) test

The growth of micro-organisms is inhibited above the concentration of 0.3%

Challenge Test Anti-microbial Effectiveness Test

The ability of preservative is determined by comparing the number of reduced bacteria for 28 days.

Summary in evaluating the cutaneous tolerance of test product

<table>
<thead>
<tr>
<th>Actual Study Dates</th>
<th>August 31, 2010 – September 3, 2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Product</td>
<td>EDE-cide plus</td>
</tr>
<tr>
<td>Subjects</td>
<td>Healthy 30 females</td>
</tr>
<tr>
<td>Age</td>
<td>27~53 (41 as average)</td>
</tr>
</tbody>
</table>

Result from the certified organization, ELLEAD Co. Ltd.

EDE-cide plus is proven for safety in accumulated patch test.

www.damychem.com
Fermentoil Olive, Argan, Green tea seed
The Quality of Plant Oil

INCI
- Pseudozyma / Olive oil ferment extract
- Pseudozyma / Argan oil ferment extract (Pending)
- Pseudozyma / Green tea seed oil ferment extract (Pending)

Fermentoil gives nutritional values and improved feeling, absorption and compatibility for usage through the microbial fermentation system.

Damy will continue on developing different types of Fermentoil.

Properties
- Non-greasy Feeling
- Improved Skin Absorption
- Improved Emulsifying Compatibility
- Nutritive

After continuous research, Damy has developed treated plant oil through unique fermentation technology.

New generation of plant oil to improve your cosmetics.
Fermentoil Series  The Quality of Plant Oil

Fermentation?

TOP 5 Healthiest Food in the world
In 2006, the food magazine ‘Health’ selected world’s top 5 foods. Among those 5 foods, 4 of the foods were fermented foods.

![Kimchi](Korea)  Yogurt(Greece)  Lentil(India)  Natto(Japan)

Effect of Fermentation on the Skin
- Naturally fermented sugar and fructose increase moisturizing effect.
- Boost of collagen from activation of glycine and amino acids.

Fermented extracts rejuvenate, moisturize and activate cells on skin.

Damy’s Fermentation Technology
Fermented materials are usually followed by strong odor, so it was not applicable in cosmetics

Pseudozyma sp. SY-16[KCTC 8950P]
- Odorless in aerobic condition
- Changes the substance in plant oil by producing enzymes
- Produces various types of polysaccharides and lipids
- KRIIBB had researched to produce bio-organisms that can clean the waste oil in the ocean
- Used in coastal area(Tae-an, Korea) to decompose the oil leakage in 2009

Analysis of Free Fatty Acid
- The amount of fatty acids left in the form of compound as triglyceride
- Detection method: Metrohm Titrato

![Olive oil](Fermentoil Olive)

- Comparing to the result before fermentation, the amount of free fatty acid increased by more than 60 times
- The increased amount of free fatty acids improves the skin absorption which will result in better application

Improved Emulsifying Capacity

![Olive oil](Fermentoil Olive)

- Emulsifying capacity of Fermentoil Olive shows 6 times higher than normal olive oil in pH5.0
- High emulsification of Fermentoil Olive occurs in a wide range of pH comparing to other olive oil

Summary of Improvement

Non-greasy Feeling
Skin Absorption  Free fatty acid value
Odorless & Colorless  Linoleic acid value
Emulsifying Capacity

General plant oil has been improved in quality and compatibility through Damy’s fermentation technology

Patent pending in corporation with Damy and Korea Research Institute of Bioscience & Biotechnology

www.damychem.com