Kudzu Zymbiozome™ Fermentum
Restore and Revitalize

INCI Name: Water & Pueraria lobata Symbiosome Extract
SAP Code#: 137980
Patent #: US 8,021,695

Key Claims
- Free radical scavenger & anti-oxidant in vitro
- Pro-collagen synthesis in vitro
- For more luminous, even toned skin

Use Level
0.1 – 1.0 %
**In Vitro** Assay for Collagen Synthesis on Normal Human Fibroblasts

- Procollagen synthesis assay on normal human fibroblasts
- Tested against a positive reference, Na Ascorbate
- 1.5% Kudzu Zymbiozome™ Fermentum extract enhanced procollagen synthesis greater than Na Ascorbate

**In Vitro** Melanin Assay Using SkinEthic™ Tanned Epidermis

- Melanin assay using tanned epidermis (SkinEthic™)
- Tested against positive reference, Ascorbic Acid
- 0.1%, 0.5% and 1%, Kudzu Zymbiozome™ Fermentum showed a dose dependent lightening effect on the tanned epidermal model

**In Vivo** Hyperpigmentation Study

- 15 Volunteers
- 2% Kojic Acid vs. 2% leghemoglobin extract
- Chromameter study evaluated the decrease in the amount of UVB-induced hyperpigmentation
- Results show that 2% leghemoglobin extract was as effective as 2% Kojic Acid on skin brightening after 10 days

**Total Color Change E* Immediate Application of Product**

<table>
<thead>
<tr>
<th>Vehicle</th>
<th>2.0% Kojic Acid</th>
<th>2.0% Leghemoglobin extract</th>
</tr>
</thead>
<tbody>
<tr>
<td>E*</td>
<td>92.9</td>
<td>92.8</td>
</tr>
<tr>
<td></td>
<td>92.6</td>
<td>92.5</td>
</tr>
<tr>
<td></td>
<td>92.4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>92.3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>92.2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>92.1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>92.0</td>
<td></td>
</tr>
</tbody>
</table>
Hyperpigmentation Process

Day 6  Irritation (red)
Day 8  Tanning Begins
Day 10  Tanning Response Continues