Innovative Cosmetic Ingredients

Develop and Upgrade New Luxury Products With High Marketing Value

Scientific innovators in the field of plant biotechnology, we are aiming at exalting the Power of Nature.

We are experts in the tailor-made development of standardized active ingredients based on undifferentiated or differentiated plant biomass.
• **Alkion** was founded in May 2011 as an Imperial College London spin-off and then transferred to Evry-Genopole at the end of 2011.

• Based on a proprietary breakthrough technology, Alkion has set up two different divisions: **Alkion BioPharma & Alkion BioCosmetics**.

• Strong of 10 full-time employees, Alkion strengths resides in 6 Researchers (PhD with previous post-doc experience), 2 PhD student and 2 specialists in cosmetic regulation and marketing/business development.
VISION: “Promoting the diversity of natural molecules found in plant biodiversity.”

MISSION: Providing cosmetic and pharmaceutical industries a secure, sustainable and cost effective supply of high quality natural active ingredients.

AMBITION: Offer to cosmetic companies the state-of-the-art production system for plant Active Biotechnological Ingredients: Premium Cells™ & Hyperactive Extracts™.
Offering Two Active Biotechnological Ingredients

**Premium Cells™**
Premium Cells™ are optimized plant stem cells which are maintained in an undifferentiated state allowing them to produce secondary metabolite (active molecules) under specific conditions. These active ingredients are used in cosmetic applications. They can be obtained as a whole cell containing the metabolites or broken to release the active molecules.

**Hyperactive Extracts™**
Hyperactive Extracts™ are optimized extracted of differentiated biomass with high yields of complex compounds. Owing to the presence of storage and specialized organs, differentiated biomass can be consider as natural molecular factories able to produce precursors and final complex compounds with very high yields.

We exalt the power of nature with a process of elicitation and standardization for both ingredients, offering exceptional opportunities for new innovative and efficient cosmetic products.
Akaburst™ is the proprietary technology of Alkion. It allows for the generation of plant differentiated biomass enriched in secondary metabolites from undifferentiated cells.

We produce active ingredients with temporary immersion and single use bioreactors. It allows for an homogeneous differentiated biomass.

Alkion can increase the quality and quantity of actives molecules within the extract.

We can optimize the culture conditions in a controlled laboratory environment.

We have the capacity to adapt the technology to norms and industrial scale.
Industrialisation Of Production

24 x 0.5L, Fully automated

60 x 10L, Fully automated

Size of 5L, 50L and 150L

NEW METHOD PATENTED IN 2009
LARGE SCALE PATENTED IN 2014
Alkion's Technology

THE PROCESSUS

✓ In vitro culture of selected plants (asepsis, laminar flow cabinet, culture room, shakers, small and large scale bioreactors).
✓ Production of undifferentiated cells (Premium Cells™) and differentiated biomass (Hyperactive Extract™).
✓ Elicitation and standardization of extracts. Alkion is standardising each ingredient with a specific marker, each batch being checked by HPLC and LC/MS if required.
Alkion's Strengths

- Shoots and roots production in specialized bioreactors
- Plant stem cells in single use bioreactors
- Plant cultivars cryopreservation
- Quality control with HPLC & LC/MS
- Specific molecules/markers identification - LC/MS
- Batch to batch reproducibility
- Quality consistency
- Standardized concentration of active molecules
- High activity
**Premium Cells™**

Active ingredients based on standardised Plant Stem cells through two routes:
- Tailor made and client specific Premium Cells™
- Direct production from in-house developed Premium Cells™

Effects such as anti-wrinkle, anti-inflammatory, whitening... protection and positive impact on growth of fibroblasts and keratinocytes, collagen hyaluronic acid - depending on plant species/specific markers

Presence of active molecules (standardisation) and precursors

Along with pigments (chlorophylls, carotenoids), proteins and carbohydrates

Additive and synergistic effect
Hyperactive Extracts™

Active ingredients based on standardized differentiated biomass from leaves, shoots or roots through two routes:
- Tailor made and client specific Hyperactive Extracts™
- Direct production from in-house developed HyperactiveExtracts™
- Classical extraction

Similar scientific characteristics as Premium Cells™ (skin effects)

Qualitative and quantitative increase of actives compounds (up to ×40)

Presence of some molecules absent from undifferentiated cells

Specialized storage organs
Advantages Of In Vitro Cultures

- **Purity & Naturality of the plant extract**: Free of GMO, pesticide, fungicide, herbicide, heavy metal, phthalates, bisphenol A... **Completely organic ingredients**, easily certifiable

- **High Level of Efficacy**: yield of active ingredients can reach 40 times what the soil grown plant offers

- **High Level of Quality**: possibly to modulate (increase or decrease) level of active molecules; HPLC/LC-MS data

- **Sustainable Technology**: 40 times less water and energy consumption, 10 times less carbon produced, production all year long – supply chain safety

- A solution to cope with the convention of **Biodiversity** (Nagoya 2010) with our relations with botanical gardens. **CBD compliance**.

- A solution **to obtain complex & rare natural** active ingredients
Alkion's capacity and capability

Our Production are batches of 25 kg (20 % Cells or Hyper, Plant Glycerin or other). We can Produce up to 5t/y diluted (1,25t/3 month). We propose a sustainable production, independent from seasons and weather, adapted to adapted clients needs.

Know How on all generations :
1st: Extracts of cells
2nd: dehydrated or frozen cells
3rd: Fresh cells in cream
4th: Elicitated cells– Benchmark
5th: Hyperactive Extracts™ (Alkion Only)

Alkion’s expertise, 50+ species in development (93 % success rate so far)

Alkion's Distributors : Quimibios (Spain, Portugal, South America) ; VS Chem group (SE Asia) ; DSKH (USA)

Alkion is implementing the norm ISO 9001 to strenghten the quality of its products.
<table>
<thead>
<tr>
<th>Premium Cells™</th>
<th>Hyperactive Extracts™</th>
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<tbody>
<tr>
<td>Artemisia annua</td>
<td>Artemisia annua</td>
</tr>
<tr>
<td>Withania somnifera</td>
<td>Withania somnifera</td>
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<tr>
<td>Acacia victoriae</td>
<td>Acacia victoriae</td>
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<td>Rosa chinensis</td>
<td>Kochia scoparia</td>
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<td>Rosa hybrida</td>
<td>Hypericum perforatum</td>
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<td>Gardenia taitensis</td>
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<td>Leontopodium alpinum</td>
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<td>Eucalyptus punctata</td>
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<td>Cyperus papyrus</td>
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<tr>
<td></td>
<td>Leontopodium alpinum</td>
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<tr>
<td></td>
<td>Eryngium planum</td>
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