Origin by Ocean's sargassum-derived bioactive proven in vitro and in vivo to modulate multiple biological skin pathways

Four *in vitro* pathways open more than 20 potential product claims for Origin by Ocean's new bioactive.

Origin by Ocean advances commercialization of the industry's first high-purity circular fucoidan through new testing and claims.

Finnish biochemical company **Origin by Ocean** has developed a new cosmetic bioactive derived from ocean overgrowth, sargassum removed from the Caribbean. In a recent *in vitro* study, the company's fucoidan, commercialized under the trade name OCEAN**BOOST**™ LF, demonstrated strong biological activity by effectively modulating four key biological markers that **support the longevity and resilience of the skin's collagen and support structure**, **while reinforcing barrier recovery, soothing even the most sensitive skin types and preventing hyperpigmentation.**

The results position the ingredient as an **effective multifunctional active for advanced skincare**. With one regenerative bioactive, you have the ability to target sensitive and atopic-prone skin, reinforce the skin barrier or address visible signs of aging such as fine lines, loss of elasticity and hyperpigmentation through a **preventative-led action**.

The AP-1 Pathway: Shifting from Reactive Repair to Proactive Resilience

A highlight of the study was the strong modulation of the AP-1 pathway. This rare 'upstream' activity mirrors the mechanism of retinol to preserve the ECM (Extracellular Matrix) by preventing damage before it starts, shifting the focus from reactive repair to preventative intervention, while providing the added advantage of skin soothing and anti-irritation.

AP-1's protection of the ECM represents a novel pathway to achieving skin longevity through resilience. Additional *in vitro* and *in vivo* testing is underway to further understand the full range of claims this pathway can unlock.

The TRPV1 Pathway: Calming the Sensitivity Response from Skin to Scalp

OCEAN**BOOST**™ LF demonstrated significant modulation of the TRPV1 receptor, the primary sensory pathway responsible for neurogenic inflammation, itching and irritation. By dampening these signals at the nerve-ending level, it effectively raises the skin's tolerance threshold to provide both immediate soothing and long-term relief for hyper-reactive skin.

Additional in vivo data supports claims for instant soothing, **the improvement of visible signs of sensitivity and a reduction in redness after 28 days at a 0.3% dosage**. This provides a novel solution for the menopausal skincare market, where hormonal shifts often trigger chronic sensitivity and persistent discomfort.

The activity also extends to scalp care, where regulating TRPV1 reduces micro-inflammation to support an optimized follicular environment, resulting in the appearance of thicker and fuller hair.

The Wound Healing Pathway: Strengthening the Barrier and Accelerating Recovery

Keratinocyte activity is the primary driver of re-epithelialization and the restoration of the skin's physical shield. By modulating this pathway, OCEAN**BOOST**™ LF encourages cellular migration and accelerates the natural repair cycle to facilitate recovery from daily environmental aggressors, reinforcing the structural integrity of the skin barrier.

This *in vitro* data is supported by new *in vivo* clinical results where **100% of subjects saw measurable improvements in both hydration and barrier integrity** after 28 days of twice-daily use:

- 23% increase in skin hydration
- 19% reduction in TEWL (Transepidermal Water Loss)

These results highlight the ingredient's ability to strengthen the skin's physical defense and maintain a resilient, well-protected surface. This repair mechanism suggests significant potential for acne and atopic-prone skincare where barrier recovery is essential, alongside applications for post-procedure care.

The Melanogenesis Pathway: Proactive Pigment Prevention and PIH Defense

The study found that OCEAN**BOOST**™ LF prevents melanogenesis through an alternative mechanism rather than typical downstream pathways like tyrosinase. This positions the bioactive as a novel solution for hyperpigmentation prevention and a strategic addition to suncare or daily protective formulations designed to stop pigment formation before it becomes visible.

This preventative focus is supported by in vivo data showing minimal effect on existing pigment, aligning with the theory that the ingredient is most effective when used proactively. Combined with its anti-inflammatory and barrier-repair activity, it offers a powerful tool for preventing post-inflammatory hyperpigmentation (PIH)—a primary concern for acne-prone ethnic skin, including Black, Indian and Asian skin types.

Produced through Origin by Ocean's patented marine biorefinery technology. OCEAN**BOOST**™ LF (INCI: fucoidan) is a high-purity, COSMOS-certified *fucoidan* active developed for advanced skincare formulations focused on:

- Skin longevity through resilience
- Soothing support for sensitive skin
- Barrier reinforcement
- Even skin tone
- Environmental stress defense

From Caribbean ocean overgrowth to high-value bioactives

OCEAN**BOOST**™ LF is produced from sargassum seaweed, which has formed massive blooms across parts of the Atlantic and Caribbean in recent years, causing environmental and economic challenges for coastal communities.

Origin by Ocean has developed a patented marine biorefinery process that isolates and purifies functional compounds from this marine biomass.

Through this process, problematic seaweed is converted into valuable biochemicals such as alginate and fucoidan, a sulfated polysaccharide known for its biological activity.

Origin by Ocean is the first operator capable of isolating purified fucoidan from sargassum at industrial relevance.

Scaling marine biorefining in Finland

Origin by Ocean is currently advancing commercialization of its ingredients and preparing for the construction of its first industrial marine biorefinery in Kokkola, Finland. The facility is expected to begin production in 2028, with a target capacity of approximately 50 tonnes of fucoidan annually starting in 2029.

The project aims to establish a new bioindustrial value chain that combines Caribbean biomass sourcing with Nordic process engineering.

ORIGIN BY OCEAN is a Finnish biochemical company transforming problematic marine biomass into sustainable, high-value biochemical products. Using its patented biorefinery process, the company refines invasive and overgrown seaweed into functional ingredients such as OCEAN**BOOST**™ (fucoidan) and OCEAN**THIX**™ (alginate).

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