

Supernatural Day Crème



Working with the skin to enhance pre-existing biological processes is a powerful way to develop wellness-adjacent skincare technology that delivers maximum benefit, without compromise. The Emma Lewisham Supernatural Day Crème recognises that the skin and its responses to the environment are intertwined with the body's circadian rhythm¹. This phenomenon is considered by many to be a key foundation of skin health and condition, and is associated with a multitude of the skin's processes such as cellular proliferation, repair, barrier function, and cutaneous immune protection². As a counterpart to the Emma Lewisham Supernatural Sleeping Mask, which supports biological processes associated with night time function, the Emma Lewisham Supernatural Day Crème supports biological processes associated with daytime function. This unique formulation supports restoration of the skin's own beneficial daytime behaviour while powerfully enhancing the complexion, delivering an elevation of what can be achieved by a daytime moisturiser.

Formulation Design & Delivery

Physiology Synchrony Unlock Method™

This formulation has been engineered in line with the Emma Lewisham P/S Unlock Method™ of product design. This method is anchored on the skin's physiology, piecing together novel combinations of up to 25 scientifically researched ingredients to work in symphony and trigger a coordinated response from the skin. This synchronous activity is designed to deliver formulations that both enhance the skin's condition and amplify its response to achieve leading results.

Why did we develop this product?

At Emma Lewisham we believe that harnessing the power of nature and working with the skin is the best way to develop skincare technology that can provide

maximum benefit without compromise. We developed the Emma Lewisham Supernatural Day Crème with the intention of harnessing biological rhythms. It is a recent discovery in the scientific world that skin function follows a biological rhythm from day to night³. By harnessing the power of daytime processes, the Emma Lewisham Supernatural Day Crème is designed to provide a rapid elevation in skin complexion while simultaneously elevating the skin's condition and appearance in the face of daytime aggressors and challenges.

This formulation was engineered in two phases. The first phase harnesses our Physiology Synchrony Unlock Method™ to target measurable skin improvements at both a cellular and clinical level, while the second phase widens the scope of impact to further elevate results through triggering improvements to the skin's own innate daytime behaviour.

Achieving an elevation in the skin's condition and appearance while combating daytime aggressors

Phase 1: Formulation Design

Phase 1 of formulation design aimed to achieve and validate that, through harnessing nature and our Physiology Synchrony Unlock Method™, the Supernatural Day Crème could deliver a market leading formulation that elevated the skin's condition and appearance in the face of daytime aggressors and challenges. Key parameters targeted were antioxidant and barrier activity, collagen synthesis, enduring hydration, and glow.

Antioxidant and barrier activity were carefully considered, as reactive oxygen species and inflammation are associated with negative impacts on the skin, along with activity that can lead to collagen degradation⁴. Alaria Esculenta extract, Vitamin C rich plant extracts, and Leontopodium Alpinum extract (sourced from high altitude due to its higher leontopodic acid concentration), have been included to target high levels of antioxidant activity and to reinforce the skin's protective barrier. In fortifying the skin's barrier and antioxidant defences, both a reduction in aggressor-entry and an increase in free radical eradication have been targeted.

While protection of collagen was a key objective due

to the heightened levels of exposure during daytime hours, this objective was further raised to target an increase in collagen production.

Challenges to the skin's hydration are abundant throughout the day, with conventional hyaluronic acid shouldering limitations of duration of impact. For this reason, a moisture-lock system was designed, comprising of Hyaluronic Acid, Saccharide Isomerate, and Ceramides. The system is designed to increase moisture, increase synthesis of the skin's own Hyaluronic Acid, and reduce loss of moisture across the skin barrier. Through both increasing and protecting the skin's moisture, all-day plumping hydration is delivered.

The desire for skin radiance and freshness is also sought from daytime formulations, targeted through gentle exfoliants and subtle illuminators. Micro doses of AHA from Caviar Lime and BHA from Willow Bark have been drawn on to gently liberate dulling skin cells and debris, while ethically sourced, superfine mica imparts a luminosity to the skin.

Phase 1: Formulation Validation

To validate product action at both a cellular level and on the skin, independent *in vitro* and *in vivo* testing was performed on the formulation, along with survey feedback gathered. The results support achievement of all key formulation objectives.

Impact Investigated	Methodology Summary	Results
Impact on immediate and sustained skin hydration	Independent <i>in vivo</i> test (2022) investigating hydration effect on skin at select time points by corneometer.	Confirmation of immediate measurably improved hydration by up to 11% within 10 minutes. Comparative impact of lasting hydration between Supernatural Day Crème and leading in-market product demonstrated Supernatural Day Crème outperformed with measurably improved hydration three days after a single application.
Upregulation of collagen production at a cellular level	Independent <i>in vitro</i> test (2020) investigating the production of Type I collagen by human skin fibroblasts.	Confirmation of increase in collagen production.
Impact on skin antioxidant protection	Independent <i>in vitro</i> test (2021) investigating the inhibitory effect of product on macrophage cells.	Confirmation of improved antioxidant protection by up to 59%, outperforming the comparatively tested leading 'age targeting' serum.
Impact on skin appearance	Consumer subjective trial with 50 women (2020).	In a consumer trial, 90% of participants noticed visible improvement to their skin's glow.

Achieving an optimisation of the skin's natural daytime functions

Phase 2: Formulation Design

While Phase 1 achieved key condition and complexion objectives, Phase 2 was initiated to address the wider physiology of the skin, working with its fundamentals to elevate what results could be achieved using a topical formulation.

Advances in ingredient technology and research have identified specific opportunities to support restoration of the skin's own daytime behaviour in the face of the impact of modern, fast-paced lifestyles. During waking daylight hours, the skin's protective mechanisms appear to be favoured, aligning with the increase in environmental insult that it experiences⁵. Unfortunately, modern lifestyles can be associated with disruption of the skin's rhythmic behaviour, challenging the skin's ability to perform its regulatory and protective behaviours⁶. By supporting restoration of the skin's natural beneficial daytime function, a key fundamental of skin health and condition, phase 2 of this formulation is designed to elevate the skin's functional foundation. By addressing the impact on the skin's circadian rhythm, a restoration of the skin's natural protective and regulatory functions was targeted. Further enhancements to increase antioxidant

and hydration activity were also incorporated.

Vitamin D precursor 7-DHC combined with Wild Indigo extract were harnessed to aid in optimising daytime cutaneous function. 7-DHC was incorporated to target support of the sebum regulation and antimicrobial activities associated with daylight hours. Wild Indigo, which has demonstrated an ability to inhibit production of the 'stress hormone', cortisol, in human skin cells was added to counteract the disruptive cellular and barrier impact associated with modern lifestyle stressors.

Further to addressing the functional fundamental – the circadian rhythm – the strength of existing formulation impacts were amplified by delivering elevated antioxidant, collagen protecting, and moisture enhancing impacts, as well as harnessing an enhanced stability Vitamin C (Tetrahexyldecyl Ascorbate) along with multiple types of Hyaluronic Acid (including 'degradation resistant' Sodium Acetyl Hyaluronate).

At its core, the formulation design addresses a typically underrecognised fundamental, the skin's circadian rhythm, a complex interplay between our circadian clock and the skin's functional processes.

Phase 2: Formulation Validation

To validate the target formulation enhancements at a mechanistic level, independent *in vitro* testing has been initiated. While research and development are ongoing, two key impacts have been confirmed at the time of writing.

Impact Investigated	Methodology Summary	Results
Impact on key enzyme responsible for collagen degradation	Independent <i>in vitro</i> test (2023) investigating the activity of matrix metalloproteinases (MMP) in human skin cell fibroblasts.	81.7% reduction in fibroblast MMP activity over 24 hours.
Direct impact on cultured human skin fibroblasts	Independent <i>in vitro</i> test (2023) investigating the proliferation of human skin cell fibroblasts.	98.5% increase in the population of human skin cell fibroblasts over 24 hours.

Supernatural Day Crème Summary

The Supernatural Day Crème offers a new era of efficacy, working with the skin to address a key functional fundamental while delivering enhancements to condition and complexion. Designed in response to the challenges faced from both internal and external environments, this formulation targets a restoration of the skin's natural beneficial daytime behaviour, alongside enhancing its complexion, to elevate what can be achieved by a daytime formulation.

References

- 1 Lyons AB, Moy L, Moy R, Tung R. Circadian Rhythm and the Skin: A Review of the Literature. *J Clin Aesthet Dermatol*. 2019 Sep;12(9):42-45. Epub 2019 Sep 1. PMID: 31641418; PMCID: PMC6777699.
- 2 Matsui, Mary S., Edward Pelle, Kelly Dong, and Nadine Pernodet. 2016. "Biological Rhythms in the Skin" *International Journal of Molecular Sciences* 17, no. 6: 801. <https://doi.org/10.3390/ijms17060801>
- 3 Michael J. Sherratt, Louise Hopkinson, Mark Naven, Sarah A. Hibbert, Matiss Ozols, Alexander Eckersley, Victoria L. Newton, Mike Bell, Qing-Jun Meng, Circadian rhythms in skin and other elastic tissues, *Matrix: Biology*, Volume 84, 2019, Pages 97-110, ISSN 0945-053X, <https://doi.org/10.1016/j.matbio.2019.08.004>
- 4 Ute Wölflle, Günter Seelinger, Georg Bauer, Martina C. Meinke, Jürgen Lademann, Christoph M. Schempp; Reactive Molecule Species and Antioxidative Mechanisms in Normal Skin and Skin Aging. *Skin Pharmacol Physiol* 1 July 2014; 27 (6): 316–332. <https://doi.org/10.1159/000360092>
- 5 Plikus MV, Van Spyk EN, Pham K, Geyfman M, Kumar V, Takahashi JS, Andersen B. The circadian clock in skin: implications for adult stem cells, tissue regeneration, cancer, aging, and immunity. *J Biol Rhythms*. 2015 Jun;30(3):163-82. doi:10.1177/0748730414563537. Epub 2015 Jan 13. PMID: 25589491; PMCID: PMC4441597.
- 6 Mary A. Ndiaye, Minakshi Nihal, Gary S. Wood, and Nihal Ahmad. Skin, Reactive Oxygen Species, and Circadian Clocks. *Antioxidants & Redox Signaling* 2014 20:18, 2982-2996 28 May <https://doi.org/10.1089/ars.2013.5645>

All Emma Lewisham products are formulated according to Regulation (EC) N° 1223/2009 which is the main European regulatory framework to strengthen the safety of finished cosmetic products. Emma Lewisham products have been independently reviewed by an expert safety assessor according to these regulations and issued a safety certificate. As part of this review, they have confirmed there are no groups of people, such as pregnant or breastfeeding women, for which Emma Lewisham products would be unsafe.

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