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Skin Deep, World Wide: Forging Friendships Through Science

LABORÉ DERMALAB REVOLUTIONAIRE PARAGONCORP

From Medical Therapy to Skin Health: Clinical Evidence for Topical NAD⁺ in UV-Induced Skin Pigmentation

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INTRODUCTION

Hyperpigmentation disorders such as melasma and post-inflammatory hyperpigmentation are commonly triggered by ultraviolet (UV) exposure. UV radiation stimulates melanogenesis through oxidative stress, inflammatory mediators, and activation of the tyrosinase pathway within melanocytes. Conventional topical depigmenting agents, including niacinamide, cysteamine, alpha-arbutin, 2-mercaptonicotinoyl glycin (2-MNG), and isobutylamido thiazolyl resorcinol (ITR), primarily act by inhibiting tyrosinase or melanosome transfer. However, their clinical use may be limited by irritation, stability issues, or incomplete control of upstream cellular stress pathways.

Nicotinamide adenine dinucleotide (NAD^+) is a critical coenzyme involved in:

- Cellular energy metabolism
- DNA damage repair via PARP pathways
- Regulation of oxidative stress through sirtuin signaling
- Modulation of inflammation

Recent dermatological research suggests that restoring intracellular NAD^+ levels may protect keratinocytes and melanocytes from UV-induced oxidative stress, thereby indirectly modulating melanogenesis.

METHOD

Randomized, single-blind study in 33 participants used a UV-induced melanization model on the back.

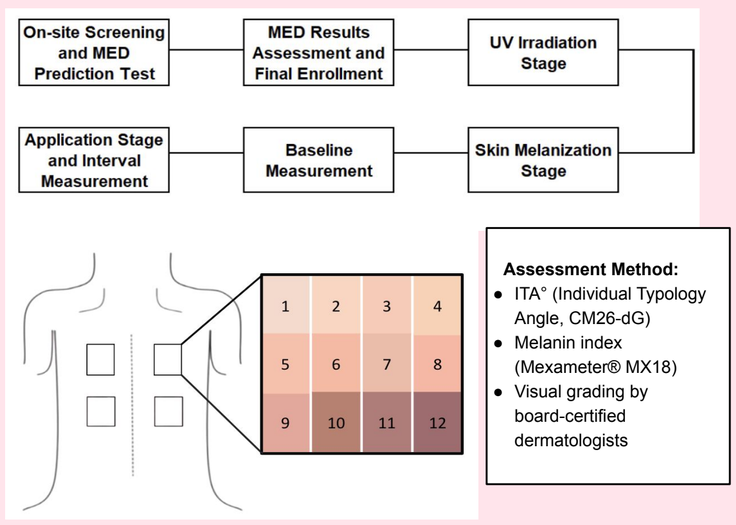
Intervention: Seven serum formulations applied twice daily for 4 weeks:

1. Placebo
2. 0.1% NAD^+
3. 10% Niacinamide
4. 2.5% Encapsulated Cysteamine
5. 2% Alpha-Arbutin
6. Commercial serum containing ITR
7. Commercial serum containing 2-MNG

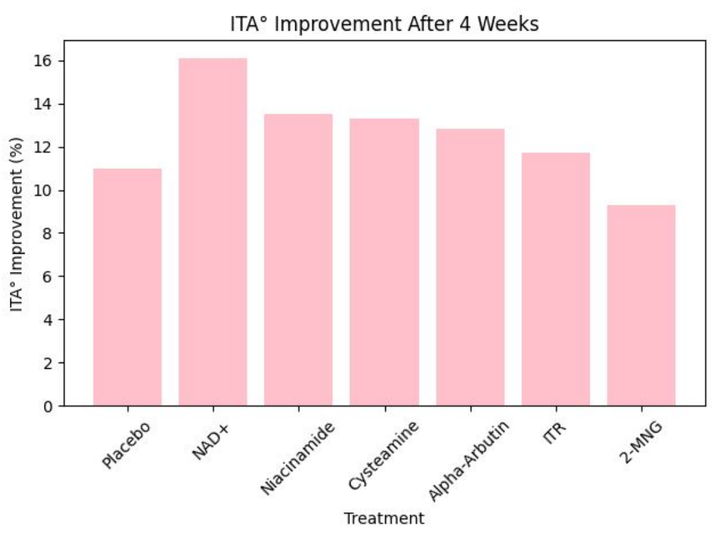
Outcome Measurements

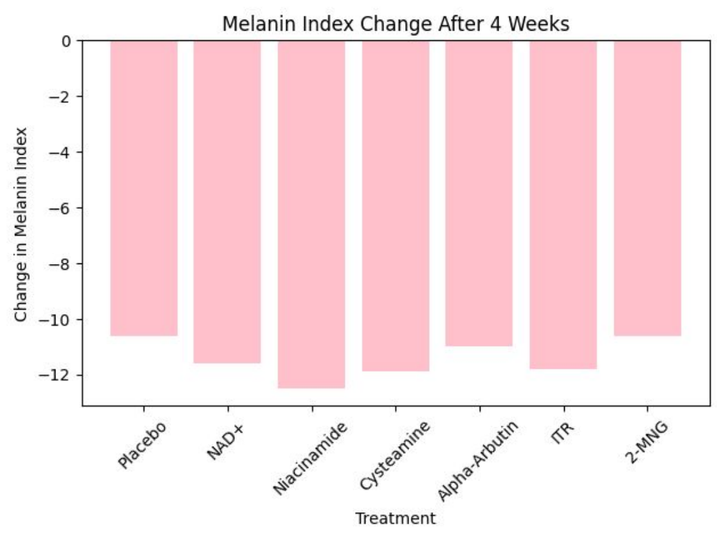
Assessments performed at baseline and week 4:

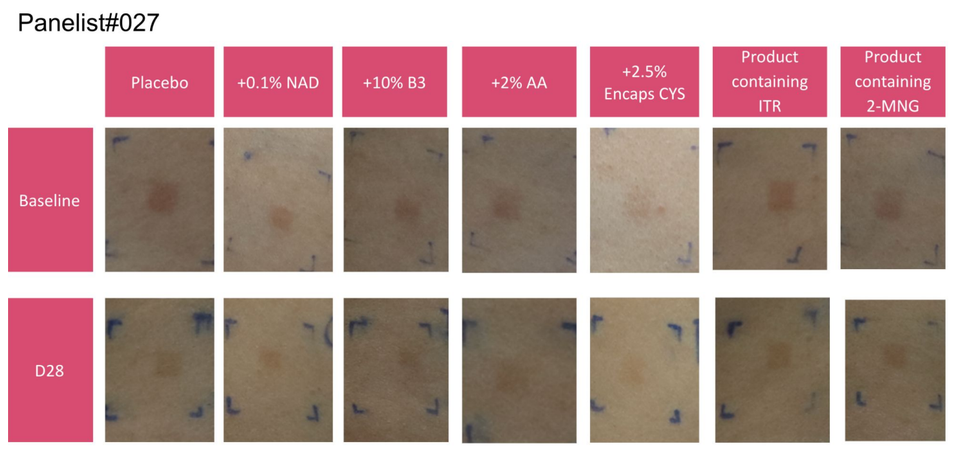
- ITA° (Individual Typology Angle) – skin tone lightness measurement
- Melanin Index (MI) – spectrophotometric pigmentation measurement
- Visual Grading – dermatological assessment of pigmentation improvement



RESULT & DISCUSSION







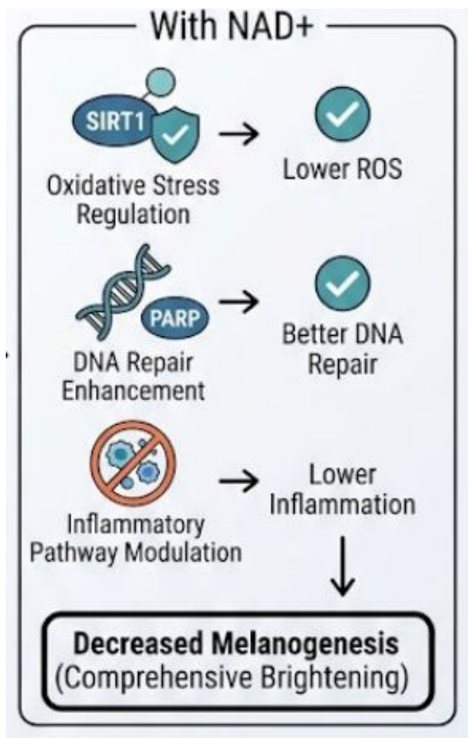
Assessments performed at baseline and week 4:

- ITA° (Individual Typology Angle) – skin tone lightness measurement
- Melanin Index (MI) – spectrophotometric pigmentation measurement
- Visual Grading – dermatological assessment of pigmentation improvement

This study shows that topical **NAD^+** significantly improves UV-induced pigmentation, with efficacy comparable to conventional brightening agents.

Unlike traditional depigmenting agents that mainly inhibit tyrosinase, NAD^+ works through broader upstream pathways:

1. **Reduces oxidative stress** via SIRT1, lowering ROS-driven melanogenesis
2. **Enhances DNA repair** through PARP activity
3. **Modulates inflammation**, reducing melanocyte activation
4. **Supports cellular energy & skin recovery** via ATP production



CONCLUSION

Topical NAD^+ improved UV-induced skin pigmentation with efficacy comparable to conventional brightening agents. These results indicate that targeting upstream cellular stress and repair pathways may complement conventional approaches to pigmentation control, supporting further investigation of NAD^+ as a novel aptopical NAD^+ improved UV-induced skin pigmentation with efficacy comparable to conventional brightening agents.

ACKNOWLEDGMENT

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