Poster number – **P1018**

Clinical Demonstration of Pigmentation Response in individuals with Fitzpatrick Skin Type V Following Irradiation with Novel Light Source at the Ultraviolet (UV) / Visible Boundary Region

Selina Moses PhD[1], Karen Meyer[1], Susan Daly PhD[1], Indermeet Kohli PhD [2], Tasneem F. Mohammad MD [2], Henry W. Lim MD [2], Joshua D. Williams PhD[1]

[1]Kenvue Brands LLC, Summit, NJ USA, [2] The Henry W. Lim, MD, Division of Photobiology and Photomedicine, Department of Dermatology, Henry Ford Health, Detroit, MI, USA

Introduction & Objectives

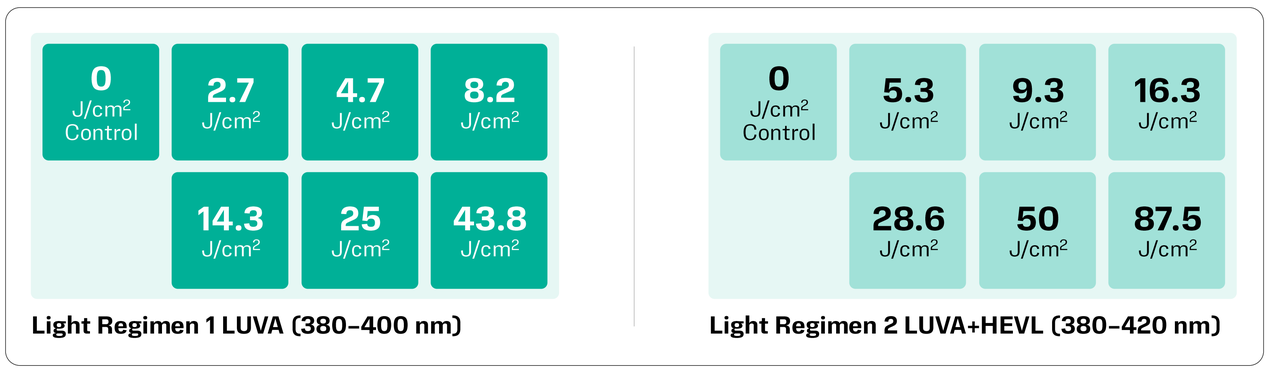
- Sunlight is comprised of ~45% visible light and 4–5% ultraviolet (UV) radiation. Both types of wavelengths induce clinically perceptible erythema, pigmentation, and oxidative stress. However, most UV filters provide protection against UVB and only partially for UVA, with limited protection beyond 380 nm.

Objectives

- To clinically elucidate the pigmentation effect of the spectral components of boundary region light, 380-400 nm (Longest UVA, [LUVA]) and 380–420 nm (LUVA and High Energy Visible Light [LUVA+HEVL]).
- To study the dose-dependent response of pigmentation on melano-competent skin using a narrow and specific novel light source in a standardized multiport format that is amenable to reproducible skin response and product efficacy testing.

Methods

- Participants (N=8) were females aged 18–38 years with Fitzpatrick skin type V.
- Unprotected test sites were exposed to an increasing 1.75x geometric dose series of LUVA (380–400nm) or LUVA+HEVL (380–420nm), with 6 doses of each series ranging from 2.7-43.8 J/cm2 and 5.3-87.5 J/cm2, respectively, delivered in 20 min by modulating the intensity of each waveguide.
  - The dose course spans from typical to exaggerated doses of these wavebands achieved in solar irradiation.
- A visual grading scale from 0–2 was used to identify pigmentation responses.
- Immediate pigment darkening (IPD) at 15 min and persistent pigment darkening (PPD) at 24 h was determined for each participant as the smallest dose to induce perceptible unambiguous darkening with defined borders filling more than 50 % of the exposure sub-site.



Boundary Region Light Tests Irradiance at Wavelengths Not Covered by Standard SPF/UVAPF Testing

Figure 1. Overlay of Standard SPF and UVAPF Light Source with Solar Irradiance and LUVA and Boundary Region Light

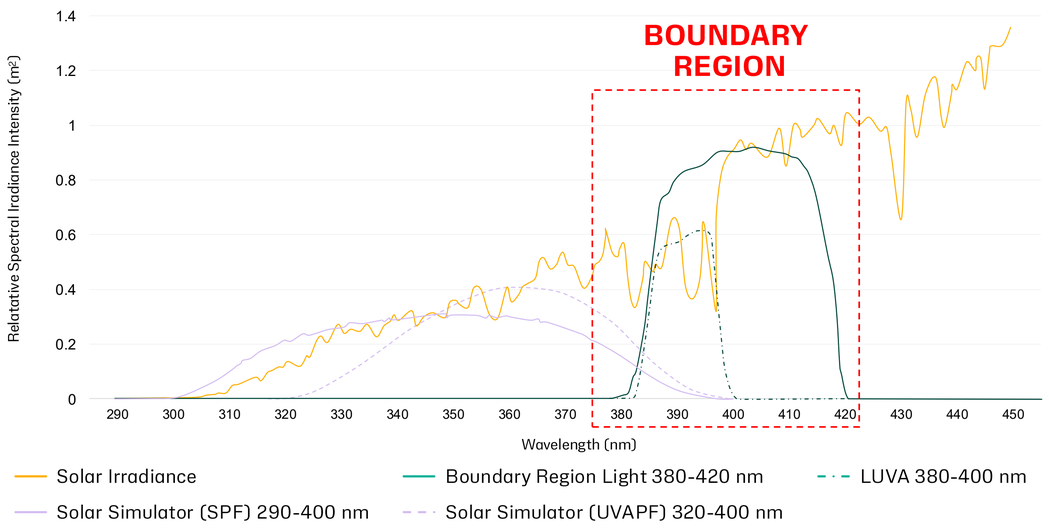
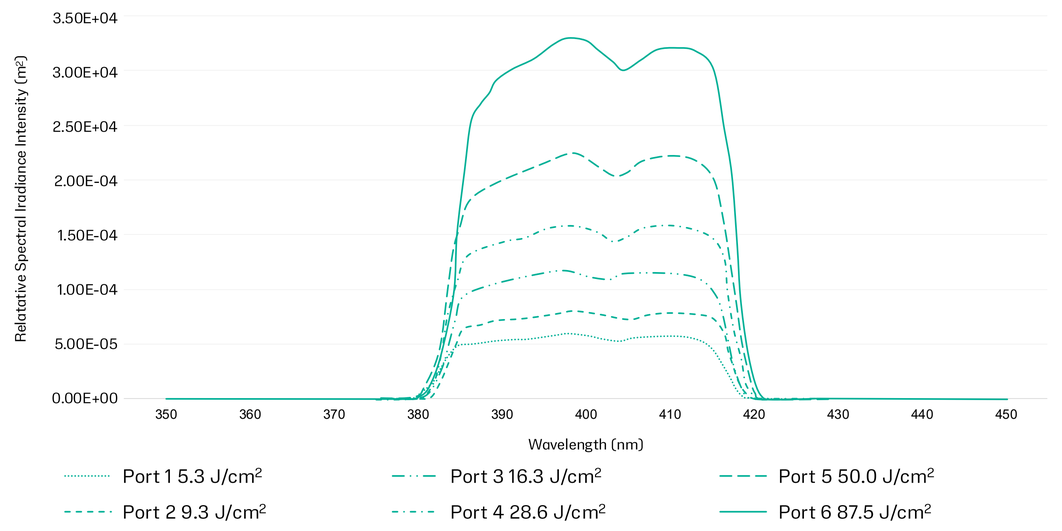


Figure 2. Boundary Region Light (380–420 nm) Doses Administered Ranged from 5.3–87.5 J/cm²



- LUVA selected waveband 380–400 nm and LUVA+HEVL selected waveband 380–420 nm is narrow with sharp cutoffs, as seen in **Figure 1.**

SPF, sun protection factor; UVAPF, ultraviolet A protection factor

- LUVA (380–400 nm) doses administered ranged from 2.7–43.8 J/cm2 (not shown in the graph)
- Sustained irradiance for both regimens was measured for each dose between the tested wavelengths **(Figure 2).**

High Dose of LUVA or LUVA+HEVL Induces Perceptible Pigmentation at 72 Hours After Exposure

Figure 3. Mean Energy ± SEM Required to Induce Perceptible Pigmentation

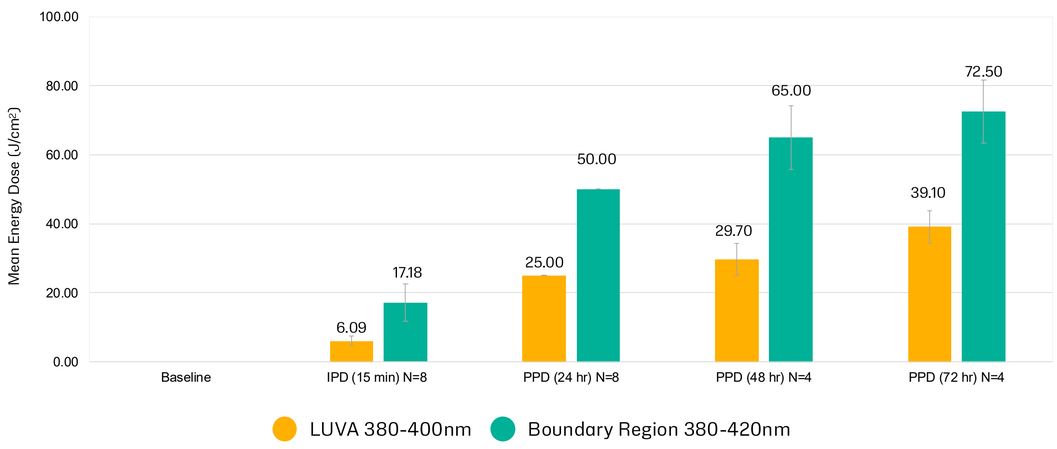
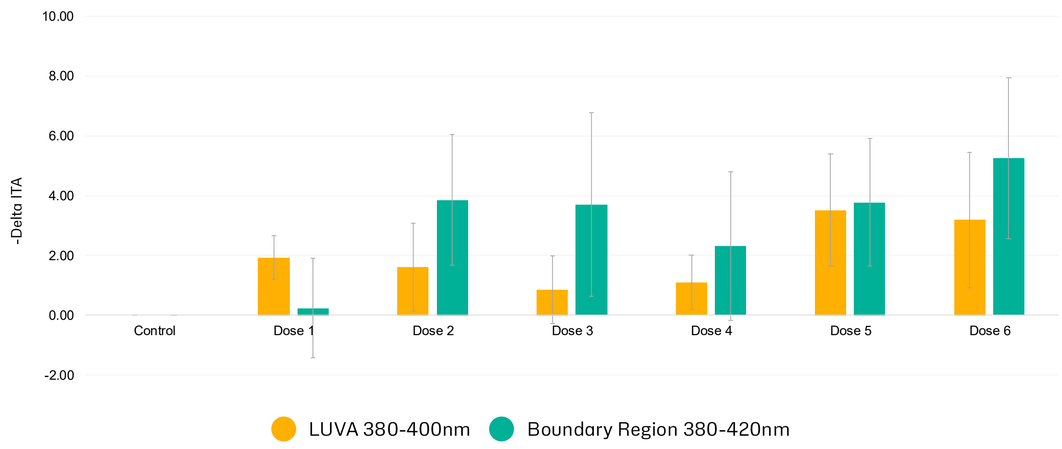


Figure 4. Delta ITA ± SEM Comparing LUVA vs Boundary Region Light Post 72 h Exposure, N=4



- Clinically perceptible immediate pigmentation was induced by exposure to both LUVA and boundary region light at real-world relevant doses **(Figure 3).**
  - LUVA (6.09 J/cm2) & LUVA+HEVL (17.18 J/cm²) equate to approximately 1.5 h of natural sunlight.
- PPD was perceptible after 24 h with doses ≥25 J/cm² **(Figure 3).**
- Individual typology angle (ITA) increased with dose and pigmentation remained perceptible 72 h post exposure at the highest doses in at least 4 of the 8 participants **(Figure 4)**.

Conclusions

- There is a growing interest to understand impact of longer wavelength UVA radiation and visible light beyond 380 nm.
- Topline findings are validation of the biologic impacts of these light ranges and the clinical suitability of the light source.
- The dose inducing IPD in the studied participants was equivalent to 1.5 h of natural sunlight in Skin Type V.
- Pigmentation lasting beyond 24 h is induced by both LUVA and boundary region light.
- 50% and 62.5% of the participants exposed to LUVA and boundary region light exhibited persistent pigmentation at 72 h, respectively.
- Future studies assessing impact of boundary region light will be enabled by use of this novel light source.

Disclosures: *This work was sponsored by Kenvue Brands LLC*
Author Disclosures: *All authors were employees of Kenvue Brands, LLCat the time of the research*

This data was already presented at the American Academy of Dermatology (AAD), March 27–31, 2026, Denver, CO, USA
European Academy of Dermatology and Venerology (EADV), September 30– October 3, 2026, Vienna, Austria