

Shiseido Confirms the Impact of Blue Light on the Skin

-Visualizes the effect of blue light-cutting technology via biophoton (UPE) measurement-

Shiseido Company, Limited (“Shiseido”) has confirmed that sunlight-intensity blue light has an adverse impact on the skin by using biophoton (UPE)^{*1} measurement technology that visualizes oxidative stress^{*2} in the skin with high accuracy and analyzing skin components. Blue light in sunlight is vastly stronger than blue light emitted from indoor lighting, personal computers and smartphones and gives oxidative stress to the skin, increasing a component (lipid peroxide) that cause skin trouble. This time, we also successfully visualized the effect of the blue light-cutting technology developed by Shiseido. Going forward, findings will be utilized to develop products that protect the skin from blue light and lead to healthy and beautiful skin.

^{*1} Biophoton (UPE; ultraweak photon emission): Extremely faint light generated from living organisms and invisible to the human eye. It is known to increase with oxidative stress.

^{*2} When UV-induced oxidative stress increases, the skin's innate abilities to maintain moisture, transparency, and firmness will deteriorate.

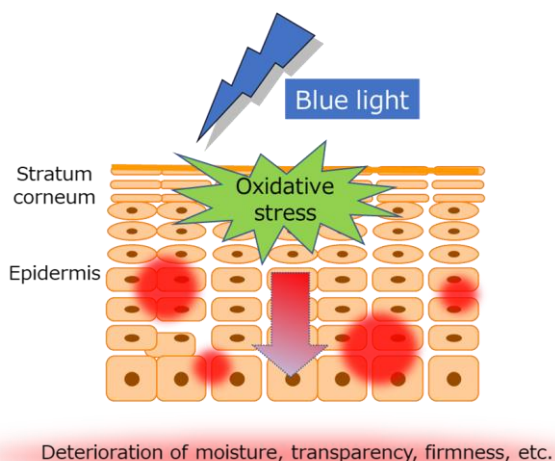


Figure 1: Impact of sunlight-intensity blue light on the skin (illustration)

Research background

Blue light has a short wavelength and relatively strong energy among the visible light. Recently, the impact of blue light on the body has begun to be identified, but its mechanism has not been clarified in detail. After conducting a survey, we found that the blue light in sunlight is several hundred times stronger than the blue light emitted from indoor lighting, personal computers and smartphones. Thus, we proceeded with research on the impact of sunlight-intensity blue light on the skin.

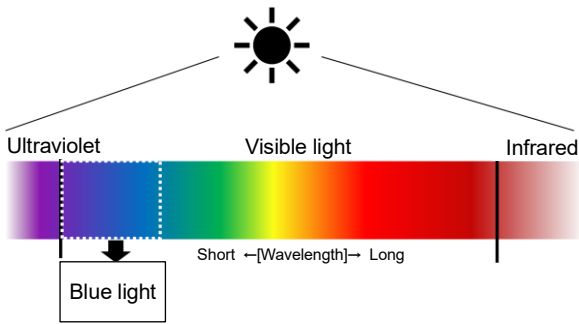


Figure 2: Blue light

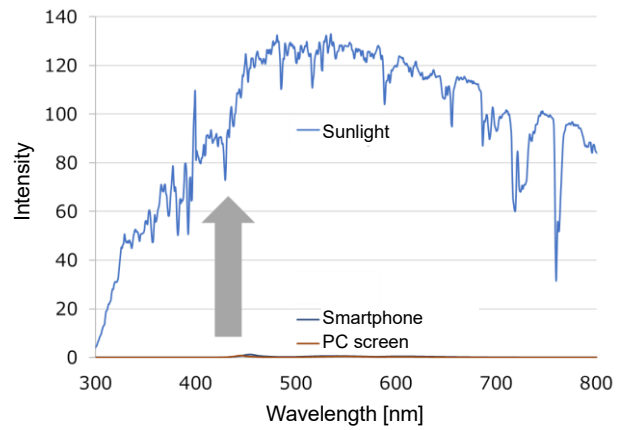


Figure 3: Blue light in sunlight is vastly stronger than that emitted by digital devices

Confirmation of impact of sunlight-intensity blue light on skin

This time, we used two methods, biophoton (UPE) measurement and skin component analysis, to verify the impact.

Biophoton (UPE) light is extremely weak and requires advanced technology to visualize, but is a useful method to evaluate oxidative stress. Shiseido has already succeeded in detecting biophoton and visualizing oxidative stress in the skin with high accuracy*³. We therefore used this technique and evaluated the impact of sunlight-intensity blue light on the skin, and as a result, it was confirmed that biophoton (UPE) increased in skin tissue irradiated with blue light, and the oxidative stress level was significantly higher compared to that in skin tissue without blue light irradiation (Figure 4).

Next, we conducted component analysis to clarify changes in the skin components, and it was revealed that a skin component (lipid peroxide) which causes skin trouble increased depending on the irradiation intensity of blue light (Figure 5).

From these results, it was found that the sunlight-intensity blue light has an adverse impact on the skin.

*³ See reference links

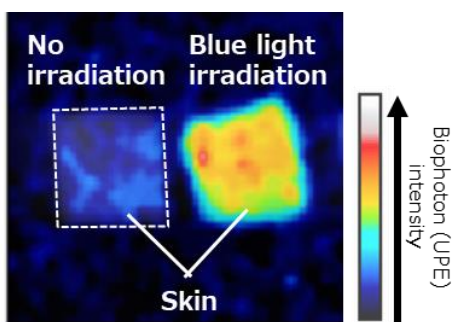


Figure 4: Blue light irradiation increases biophoton (UPE)

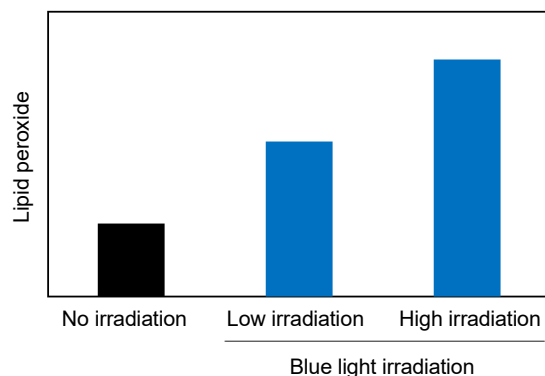


Figure 5: Blue light irradiation increases the skin component that causes skin problems

Visualization of effect of blue light-cutting technology

Through biophoton (UPE) measurement, we verified the effect of Shiseido's blue light-cutting technology and it was revealed that skin tissue applied with a formula of blue light-cutting technology and irradiated with blue light had lower biophoton (UPE) intensity than skin tissue without application. In other words, it may be considered that the skin can be protected from oxidative stress by cutting blue light.

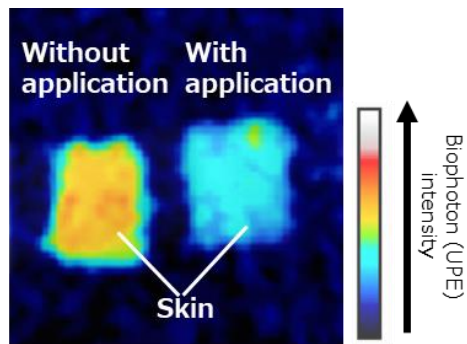


Figure 6: blue light-cutting technology reduces oxidative stress

Until now, Shiseido has regarded that UV-induced oxidative stress is one of the causes of photoaging^{*4}, and conveyed the importance of daily skincare routine. In this research, we confirmed that sunlight-intensity blue light also damages the skin, and have acknowledged that it is important to protect the skin not only from UV rays but also from blue light in order to maintain healthy and beautiful skin. Going forward, Shiseido will utilize research results achieved to date and develop products that protect the skin from UV rays as well as blue light.

^{*4} Skin aging phenomenon such as "spots and wrinkles" caused by UV rays in sunlight. It is considered to be the main cause of skin aging.

[Reference] Related past technology releases

2018: Shiseido Visualizes Sunscreen's Effect of Preventing UV-induced Skin Oxidative Damage

<https://corp.shiseido.com/jp/news/detail.html?n=00000000002465> (Japanese only)

2019: Shiseido Finds Regional Differences in Oxidative Stress in Face via Biophoton Measurement

<https://corp.shiseido.com/en/news/detail.html?n=00000000002799>