

## Safety Corner

What is SPF in UV protection?

'SPF' stands for 'Sun Protection Factor', which indicates how long a sunblock remains effective on the skin. The SPF rating of a sunblock is typically determined by exposing human subjects to a light spectrum mimics noonday sun with and without wearing a sunblock. The SPF is roughly the duration of exposure that induces redness in sunblock-protected skin divided by the duration of exposure that induces redness in unprotected skin.

There is a popular oversimplification of how SPF works: if users normally get sunburn in 10 minutes, then an SPF-15 sunblock would allow them to stay in the sun 150 minutes (i.e.; 15 times longer) without getting sunburn. Another common misperception is that a sunblock with a higher SPF proportionally provides more effective protection. The difference between an SPF-15 sunblock and one with SPF-50 is  $1/15 - 1/50$ , or is only roughly 5%; not so for their difference in price. Similarly, the difference in protection between SPF-15 and SPF-30 is roughly 3%.

Owing to consumer confusion over the degree and duration of protection offered, sunblock labels in the EU are restricted to SPF 50+ to limit unrealistic claims, while Australia's upper limit is 30+. Moreover, SPF is an imperfect measure of skin damage because conventional sunblocks offer very little protection against UVA (wavelength 320-400 nm), which does not cause reddening or pain but can cause invisible damage and skin aging, as well as DNA damage to cells deep within the skin, increasing the risk of skin cancer. There is currently no uniform measure of UVA absorption. Recent research suggests that broad-spectrum sunblocks containing zinc oxide can protect against UVA at wavelengths of 340-380 nm.

Exposure to small amounts of UV radiation can have beneficial effects, such as vitamin D synthesis in the skin; however, excessive exposure to UV has adverse health effects to the skin, eye and immune system. Applying sunblock with an SPF of 15 or above is essential to protect against UV exposure. Sunblock must be re-applied after swimming or sweating to maintain protection

=====

The Safety Corner is contributed by Ir Dr Vincent Ho, who can be contacted at [vsho@UCLA.edu](mailto:vsho@UCLA.edu)