

BASICS OF RADIATION BIOLOGY (RADIOBIOLOGY)

206 BIOCHEM

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2020

The



Sun

Helpful

Keeps Us Warm



Helps Plants Grow



Harmful

Causes Sunburns



Makes Our Skin Wrinkle مجعد



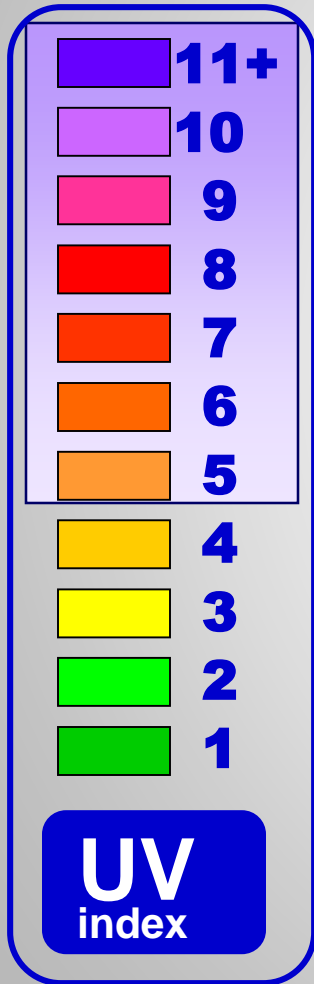
UV Radiation Exposure

Ozone layer

It is a thin shield high up in the sky. It protects life on Earth from the sun's ultraviolet (UV) rays.



How do we measure UV radiation levels?



We use the UV Index Scale.

Reported on a scale of 1 -11+.

Take special care when
the UV Index is 5-6 or
higher.

Biological Effects of UV Radiation Exposure

Absorption by Skin

- ▣ Excessive doses of ultraviolet radiation (UV) cause photochemical damage of tissue:
 1. UV photons disrupting DNA structures directly, or indirectly from free radical formation.
 2. The skin can suffer mild effects such as erythema (redness) of the skin, to burning and swelling; to severe effects, such as skin cancer.
 3. The eyes can suffer from corneal burns and cataract formation إعتام عدسة العين.



Skin cancer

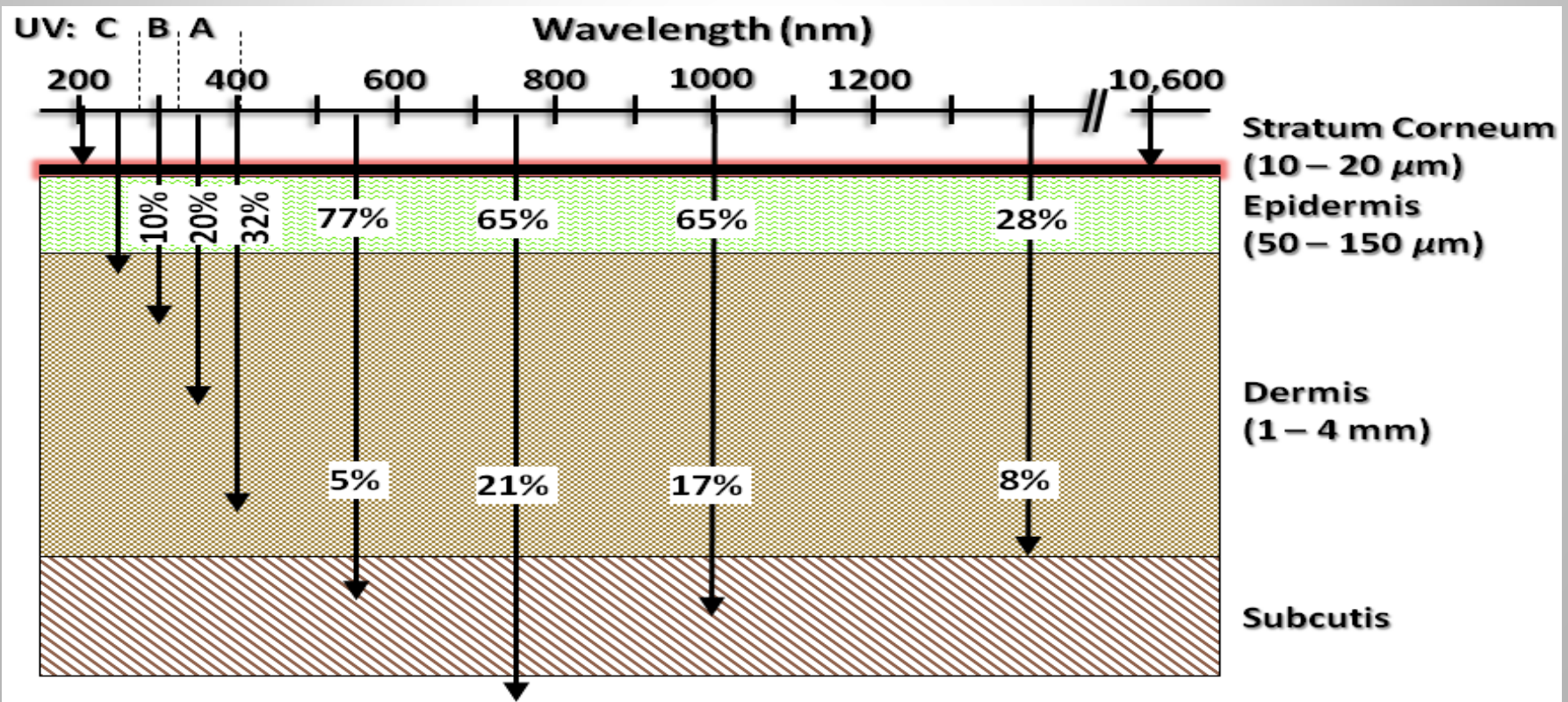


cataracts

Biological Effects of UV Radiation Exposure

Absorption by Skin

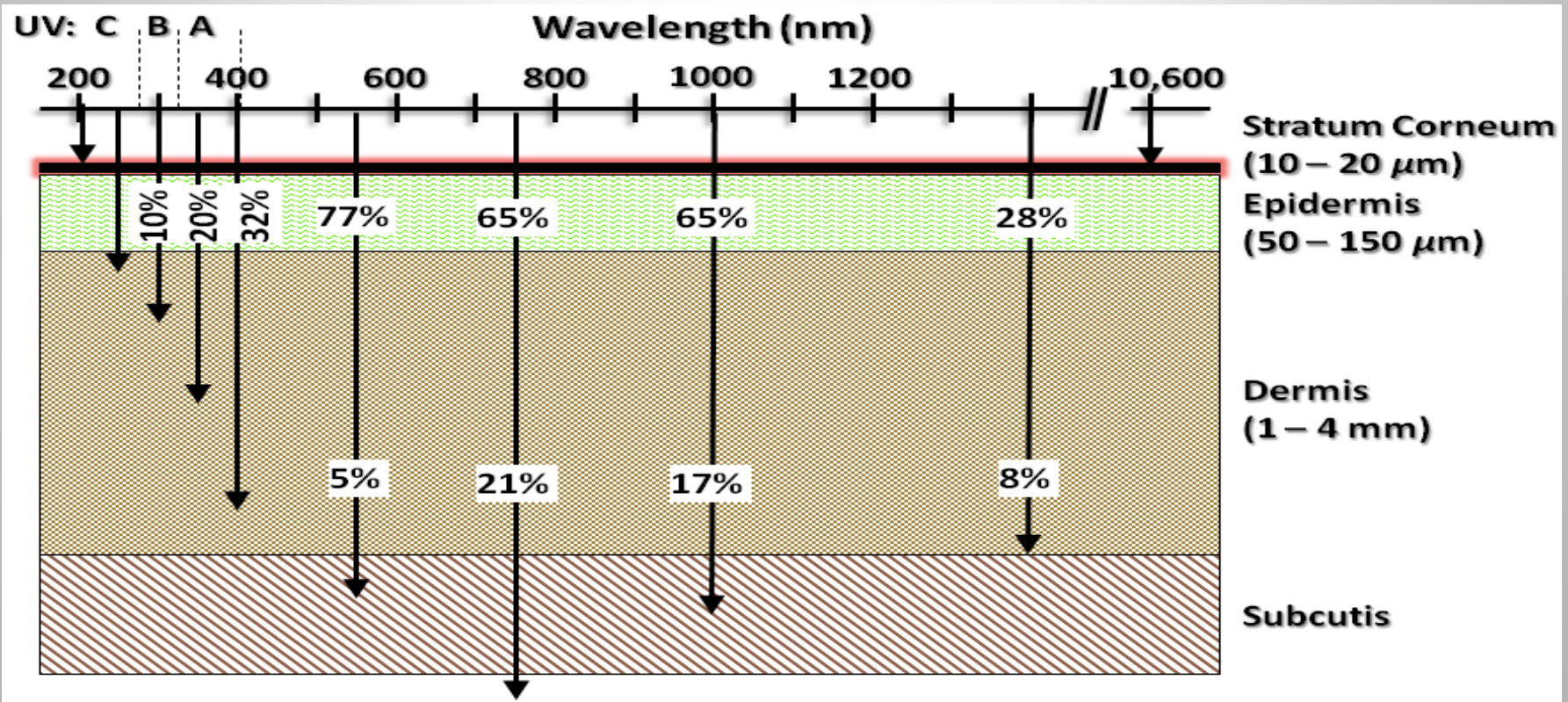
- The absorption depth of UV radiation by the skin changes with wavelength, as seen in the Figure. The [UV-C band](#) (a far-ultraviolet band absorbed by our atmosphere but present in many industrial sources) is absorbed by the dead skin layers, but in the [UV-A band](#), the radiation penetrates as deep as the dermis layer.



Biological Effects of UV Radiation Exposure

Absorption by Skin

- In response to the presence of UV radiation, the epidermis layer produces melanin to counteract the photochemical damage caused by UV radiation. The melanin is distributed in the stratum corneum as well as the epidermis layer of the skin. The epidermis continually produces new skin cells, helping to lessen the damage induced in this region.



Biological Effects of UV Radiation Exposure

Absorption by Skin

- ▣ **Skin Type:** Skin type plays a role in an individual's responsivity to UV light. A numerical classification system (Fitzpatrick scale) was developed to categorize skin types as follows:

Skin Type	Sensitivity	Description
I	Very High	Light, pale skin: always burns, never tans
II	High	White, fair skin: burns easily, difficulty tanning
III	Moderate	Medium: may burn, always tans
IV	Less	Olive skin: rarely burns, always tans easily
V	Minimal	Brown to dark brown: rarely burns, tans easily
VI	Minimal	Black skin: rarely burns

Sun Safety Actions



**Limit Time in
the Midday Sun**



**Wear
Sunglasses**



Seek Shade



Use Sunscreen



Cover Up



**Avoid Tanning
Parlors (Salons)**



Wear a Hat



**Watch for
the UV Index**

