



‘Clinically  
Useful’  
Penetration  
Depth



# 'Standard' Penetration Depth

- Depends on....
  - Wavelength
  - Purely 'scientific'
  - No regard for clinical targets

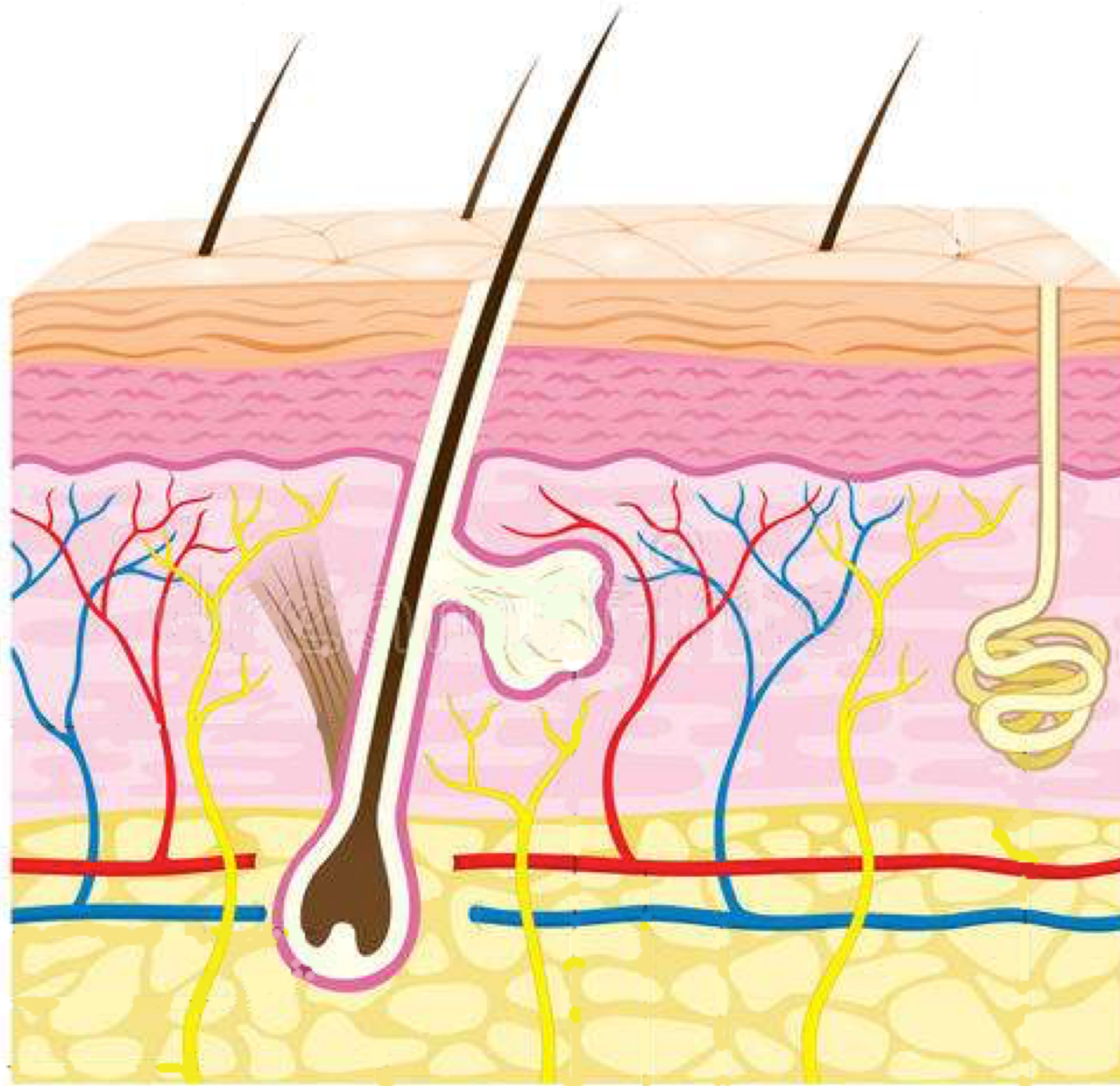




# ‘Clinically Useful’ Penetration Depth

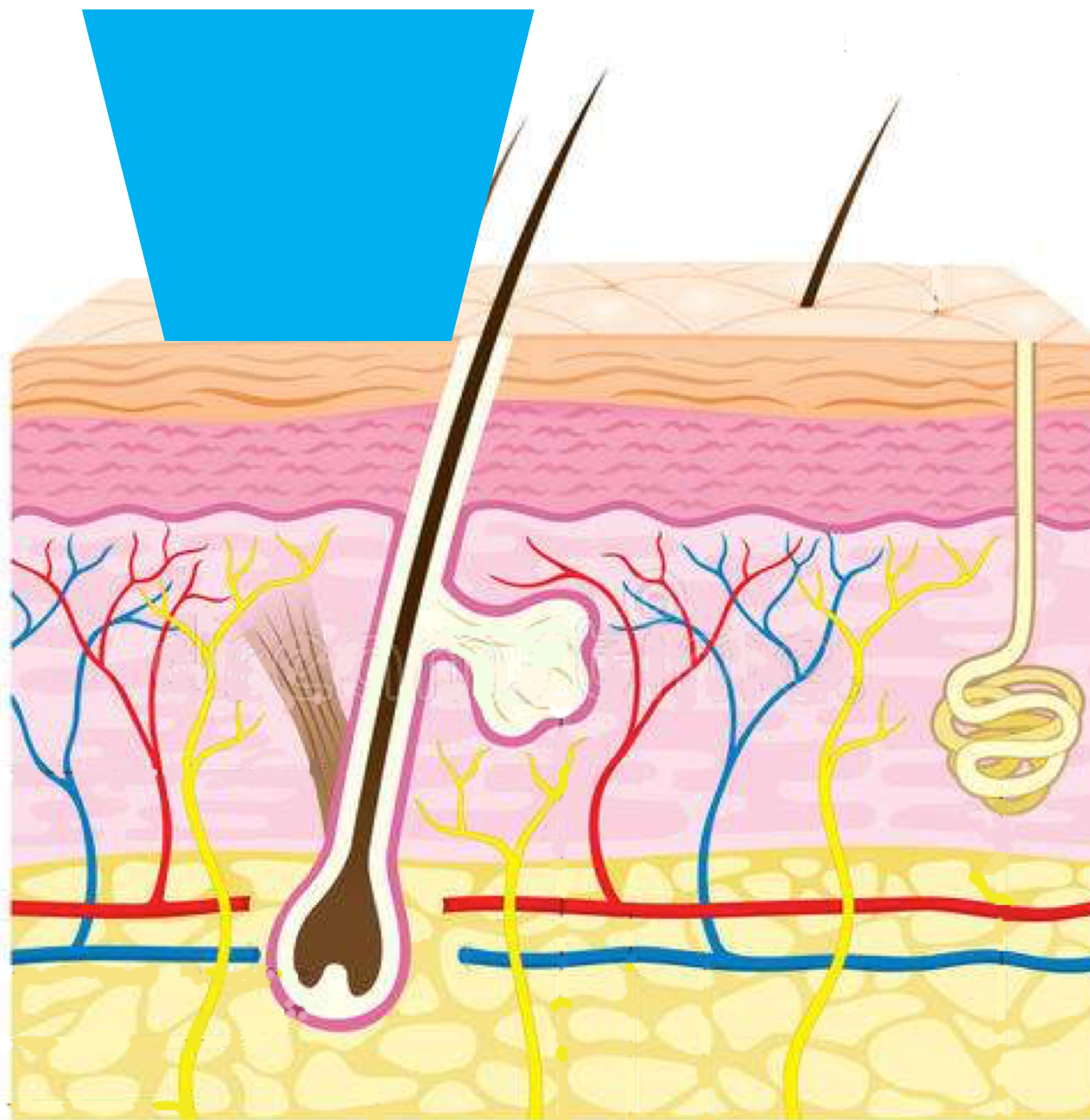
- Depends on....
  - Wavelength
  - Anisotropy
  - Spot diameter
  - Incident fluence

## Penetration depth – wavelength & anisotropy





Blue light

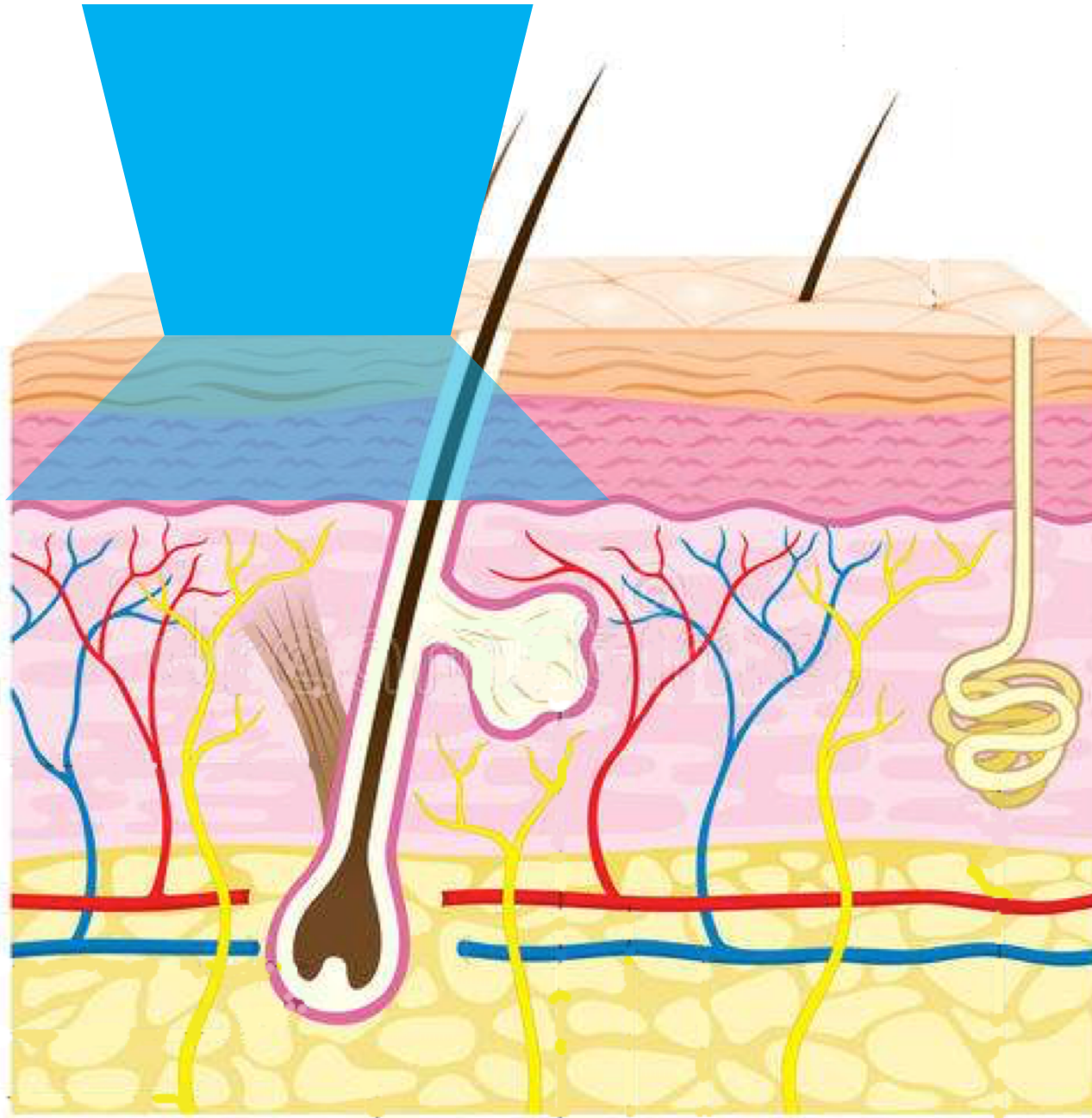


Same spot  
diameter  
Same fluence

Different  
wavelengths



Blue light

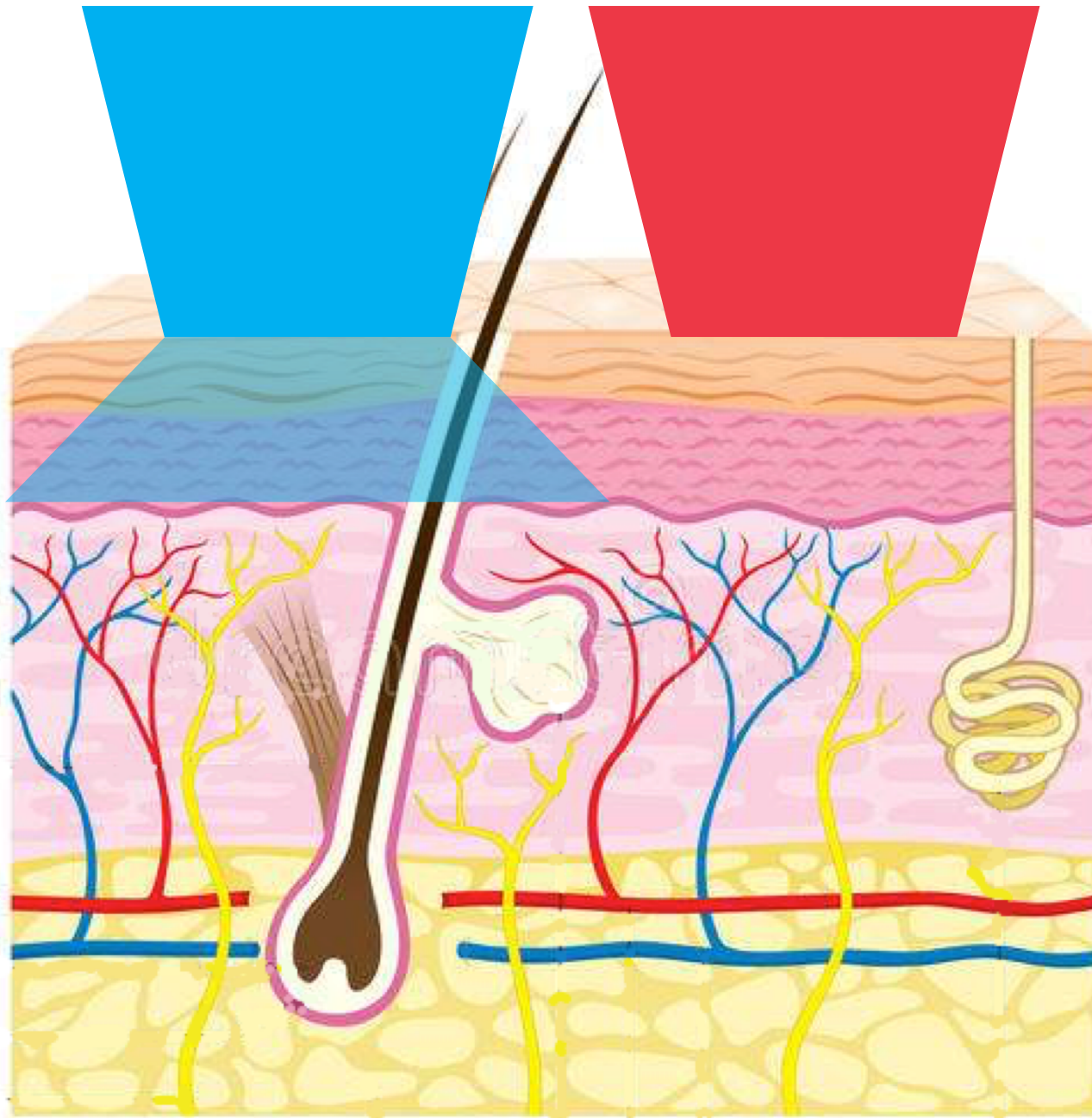


Same spot  
diameter  
Same fluence

Different  
wavelengths

Blue light

Red light



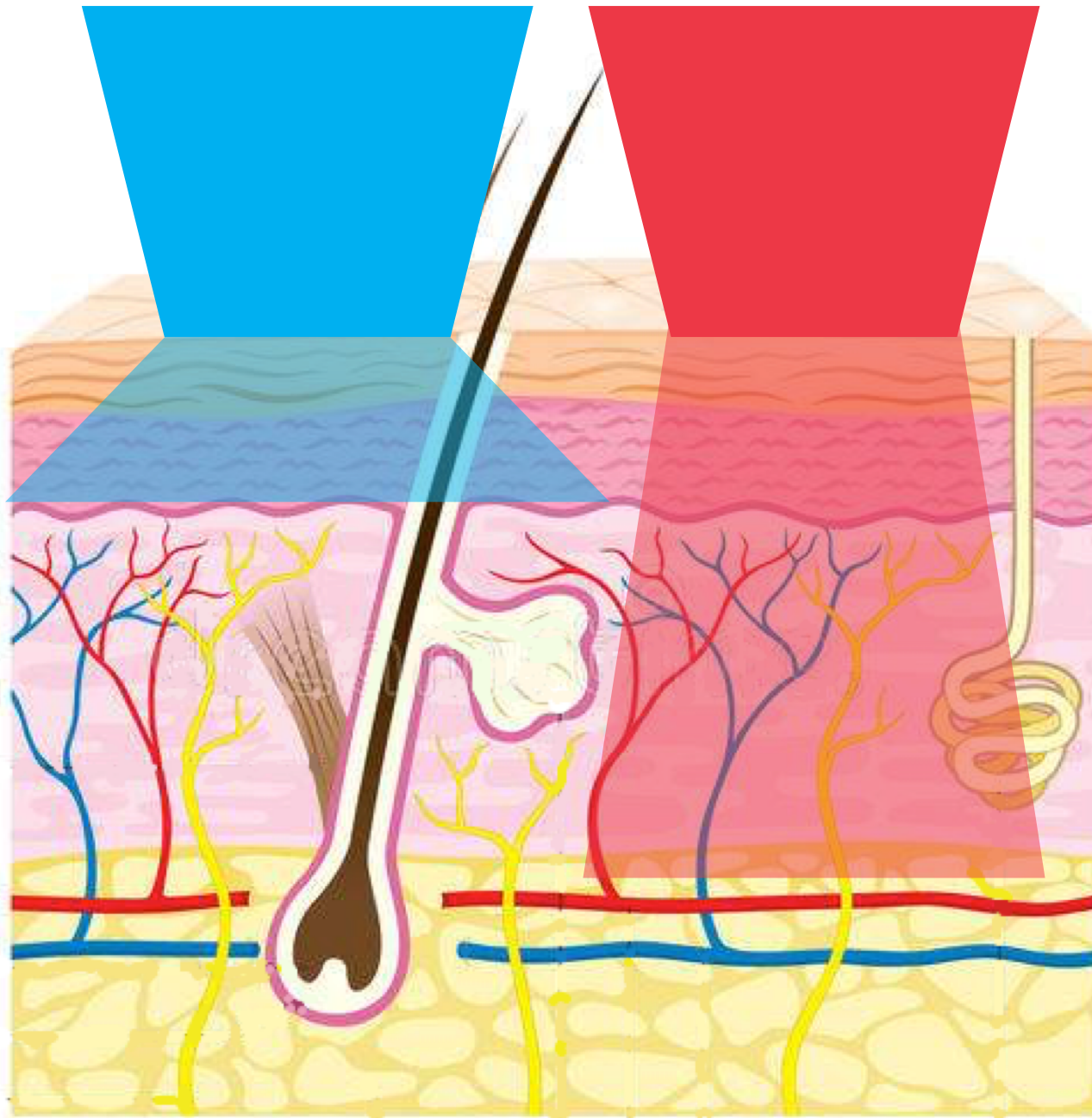
Same spot  
diameter  
Same fluence

Different  
wavelengths



Blue light

Red light



Same spot  
diameter  
Same fluence

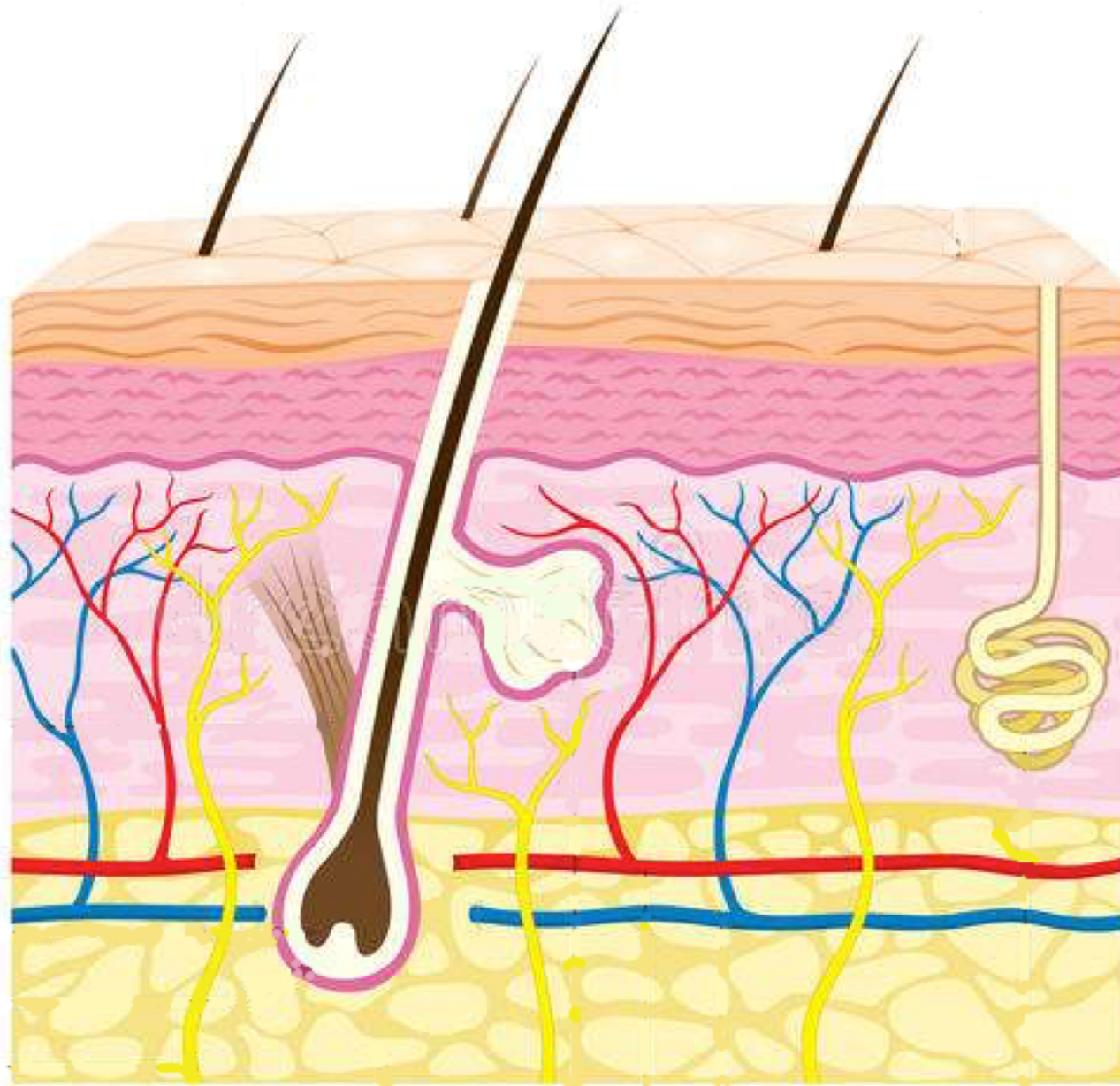
Different  
wavelengths

Red light  
penetrates  
deeper than blue  
light

Anisotropy is the  
sideways 'spread'  
of the light with  
depth due to  
scattering

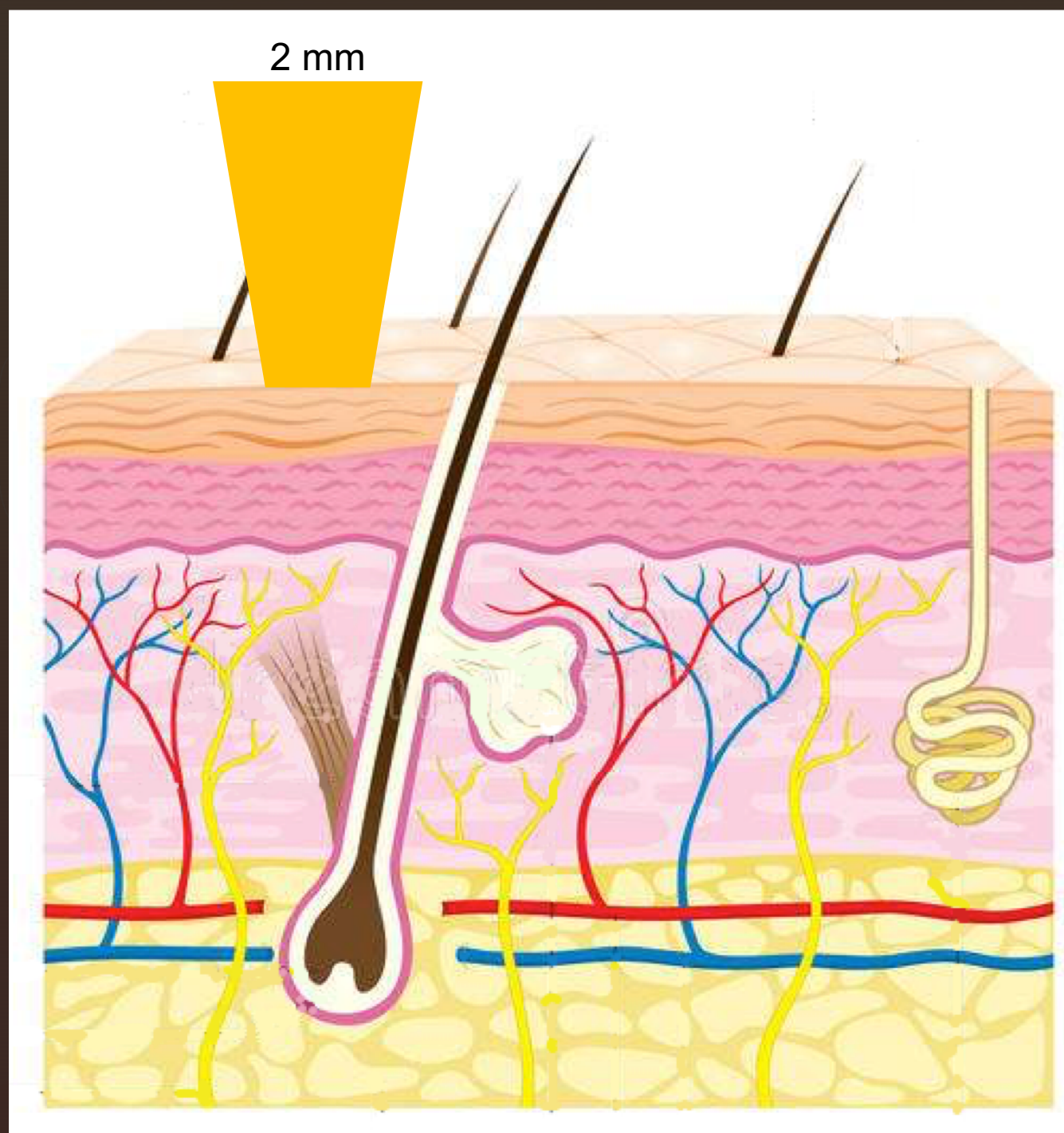


## Penetration depth – spot diameter



Same  
wavelength  
Same fluence

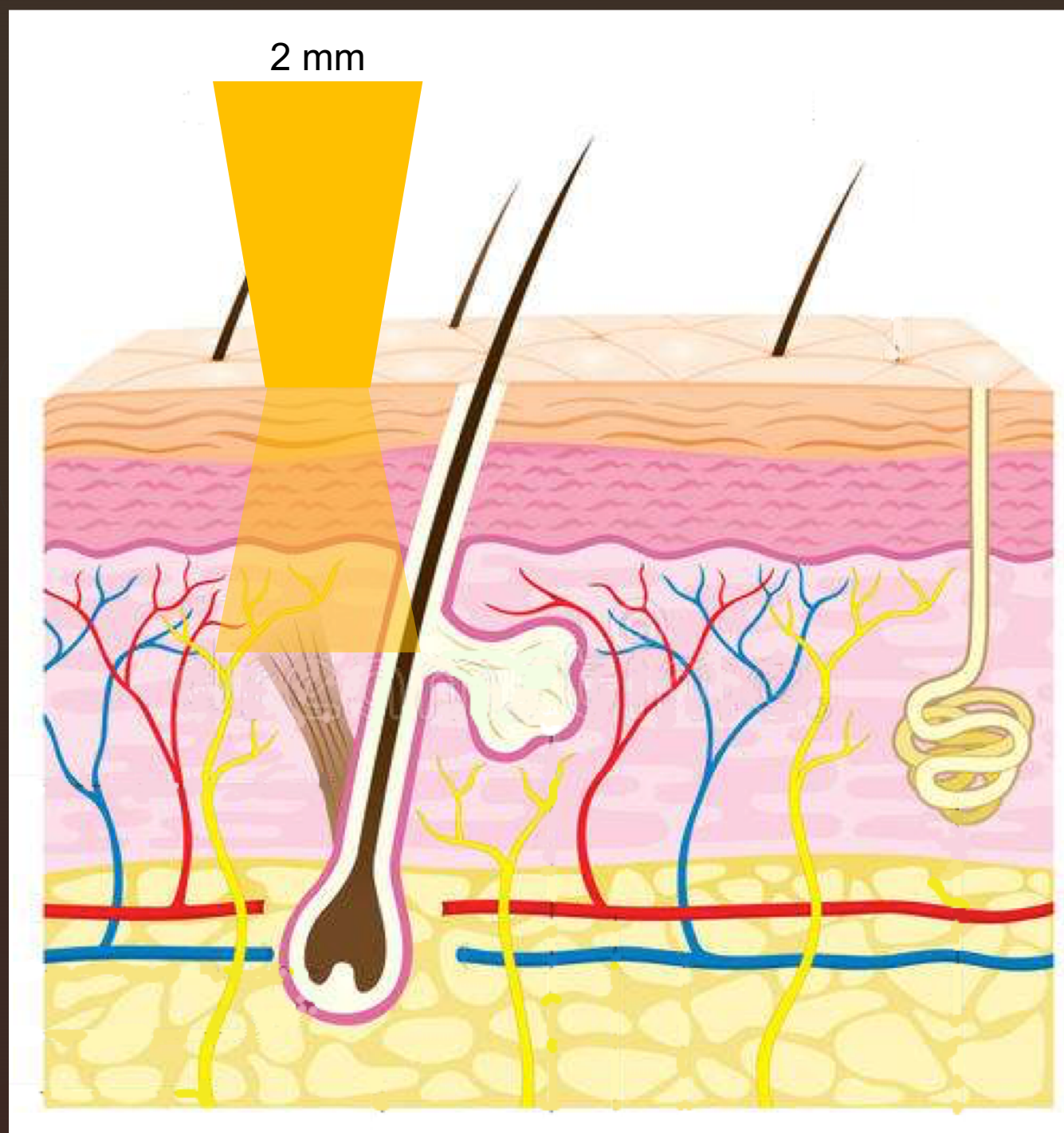
Different spot  
diameters





Same  
wavelength  
Same fluence

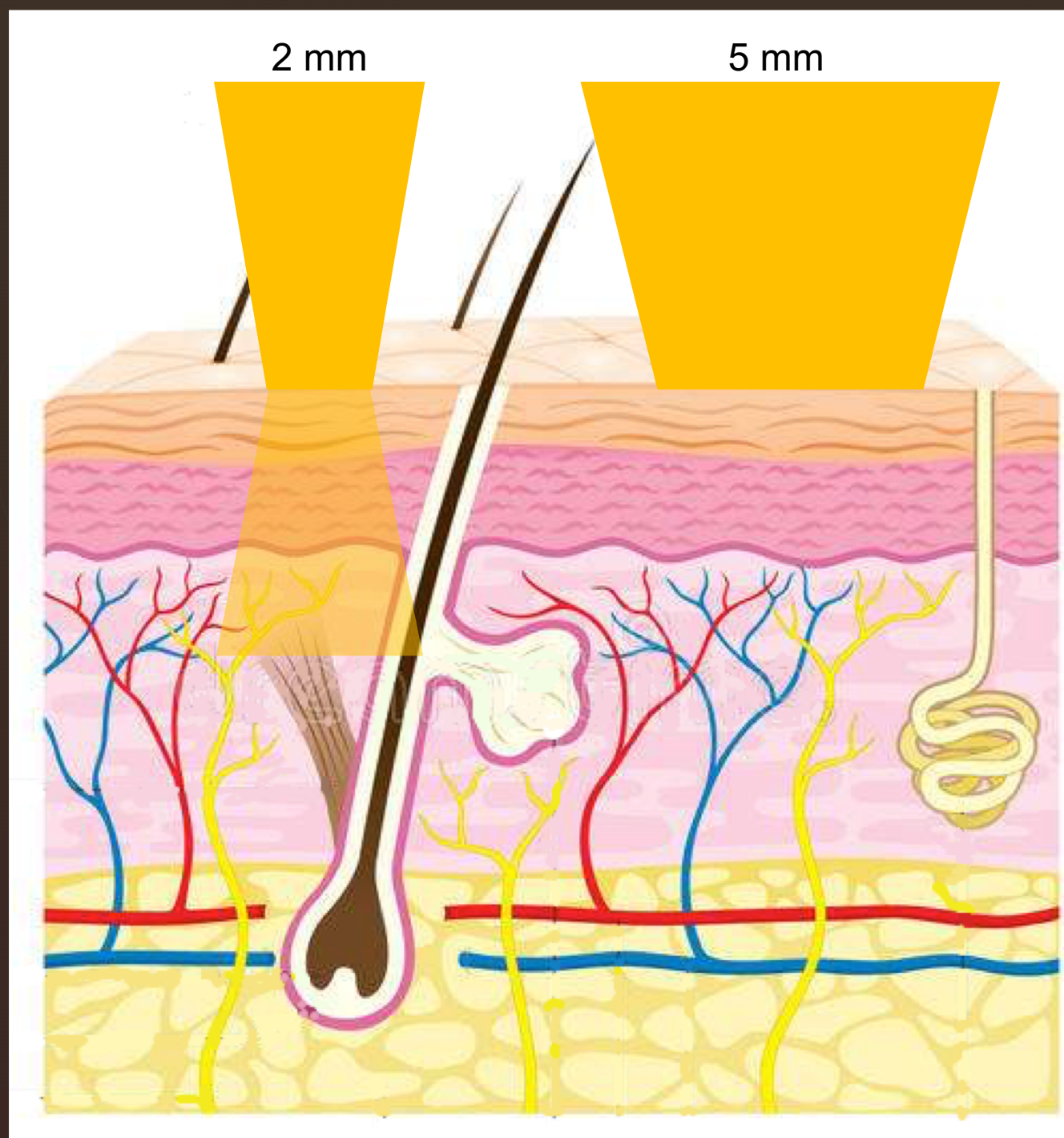
Different spot  
diameters





Same  
wavelength  
Same fluence

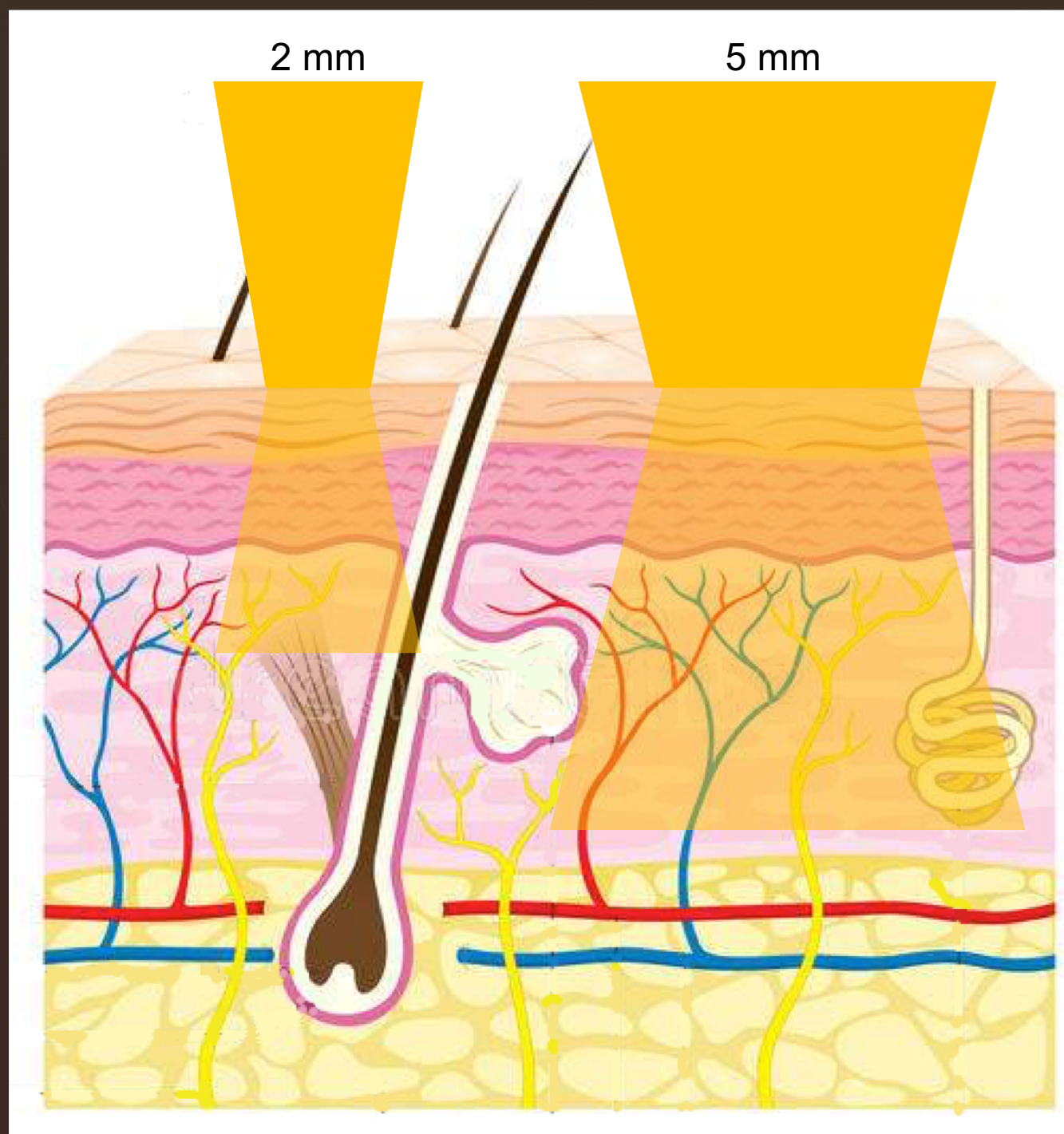
Different spot  
diameters





Same  
wavelength  
Same fluence

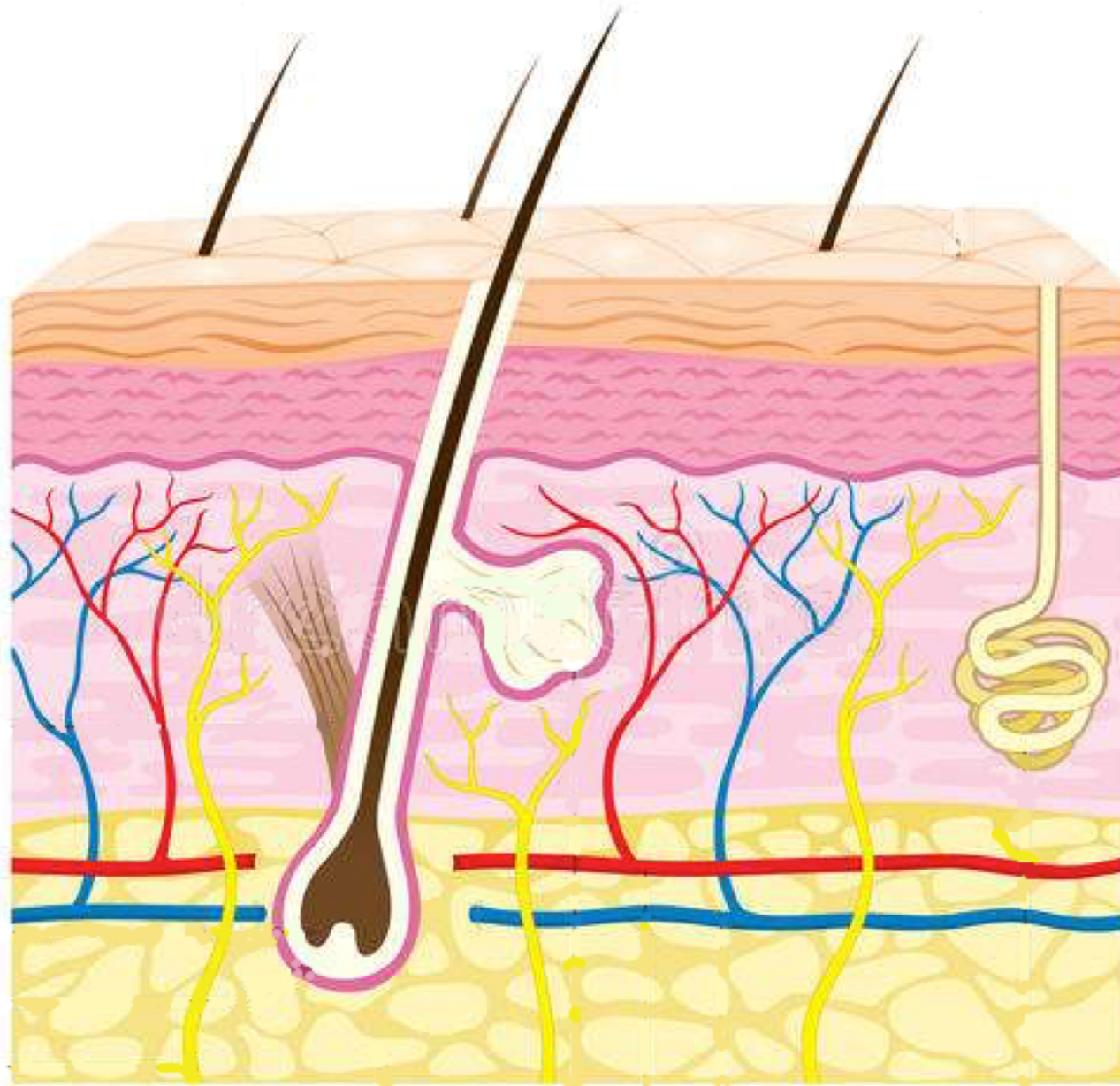
Different spot  
diameters



Larger spot  
sizes penetrate  
deeper in the  
dermis



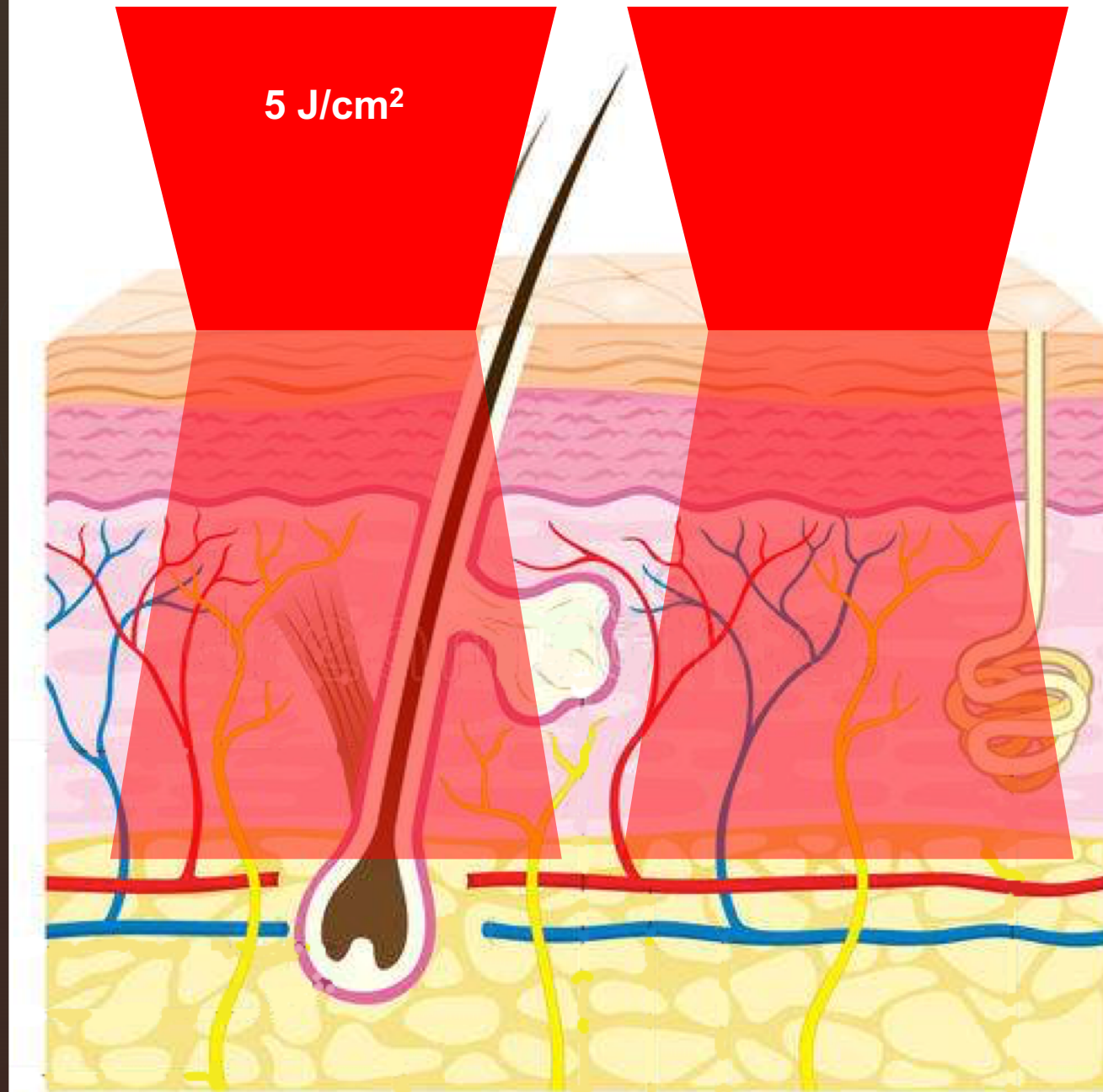
## Penetration depth – incident fluence





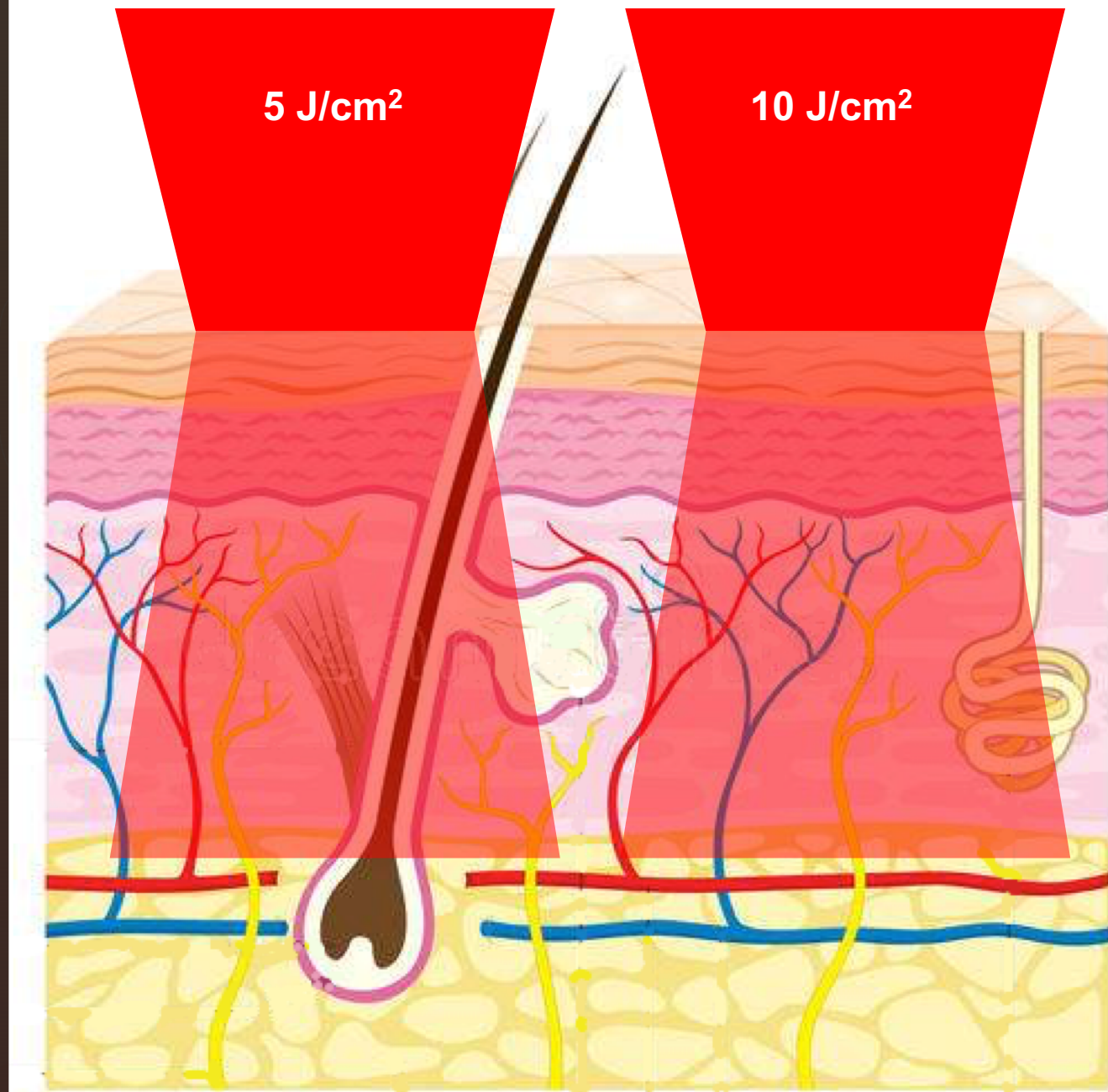
Same  
wavelength  
Same spot  
diameters

Different  
fluences at the  
skin surface



Same  
wavelength  
Same spot  
diameters

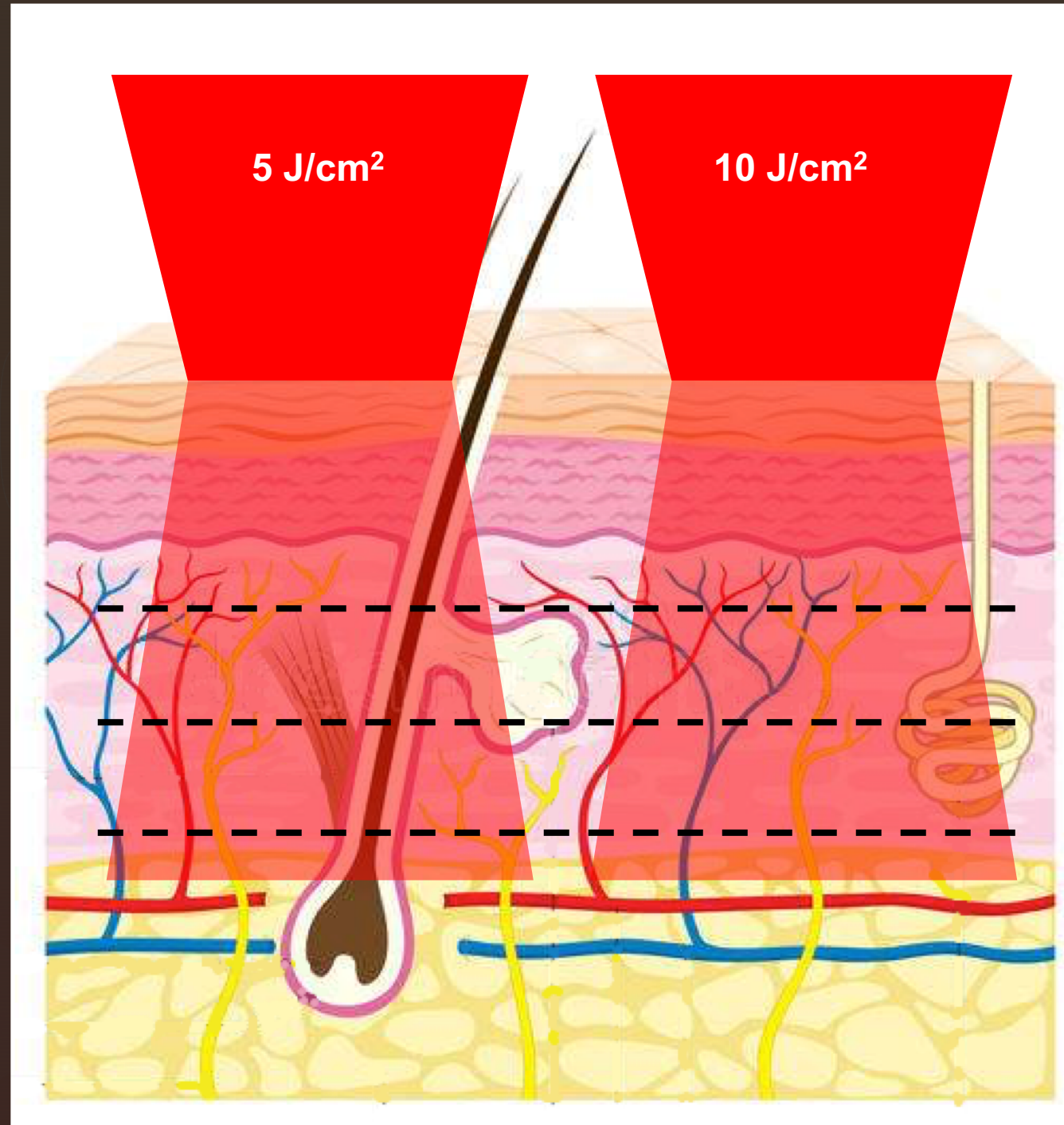
Different  
fluences at the  
skin surface





Same  
wavelength  
Same spot  
diameters

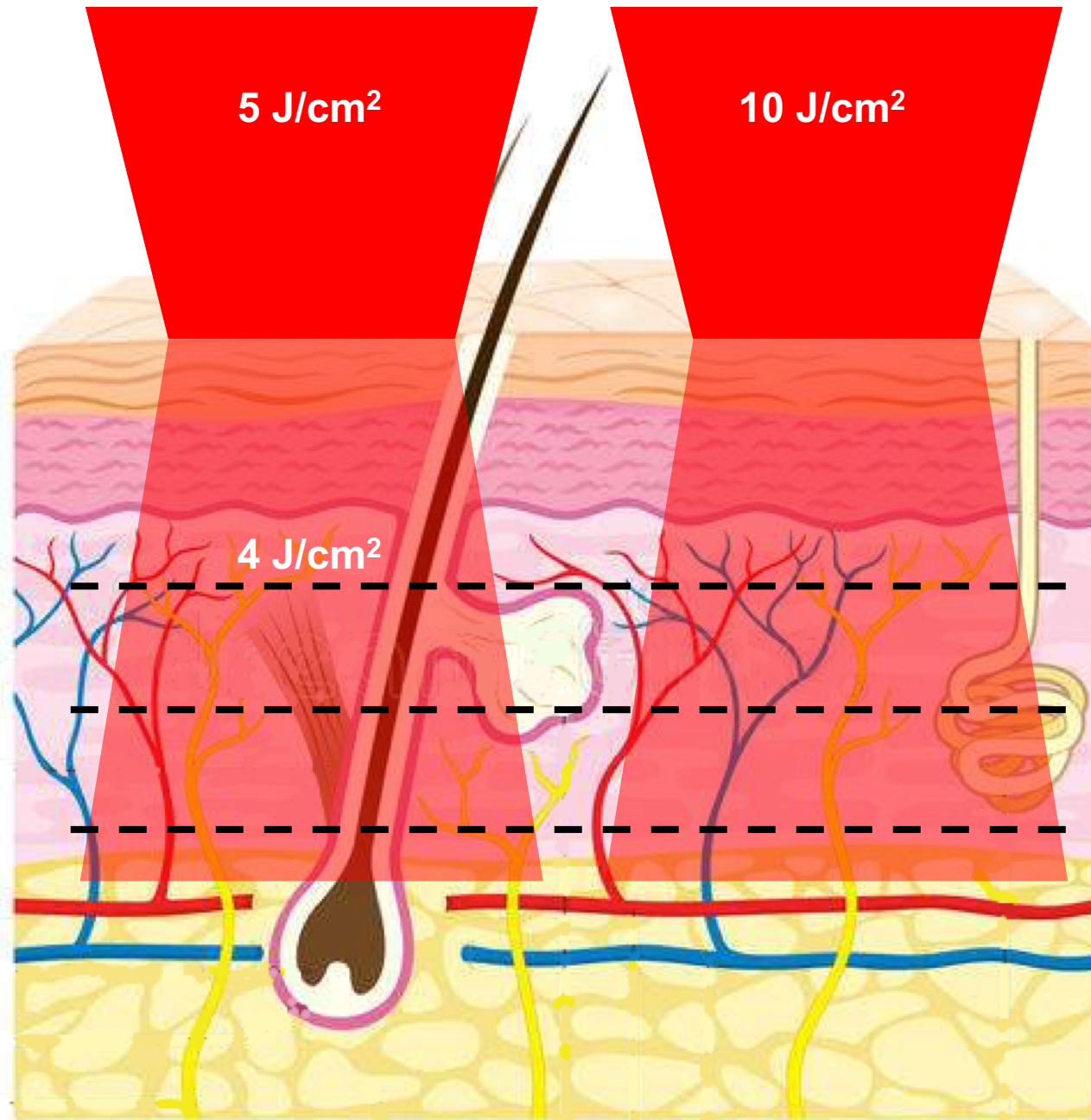
Different  
fluences at the  
skin surface





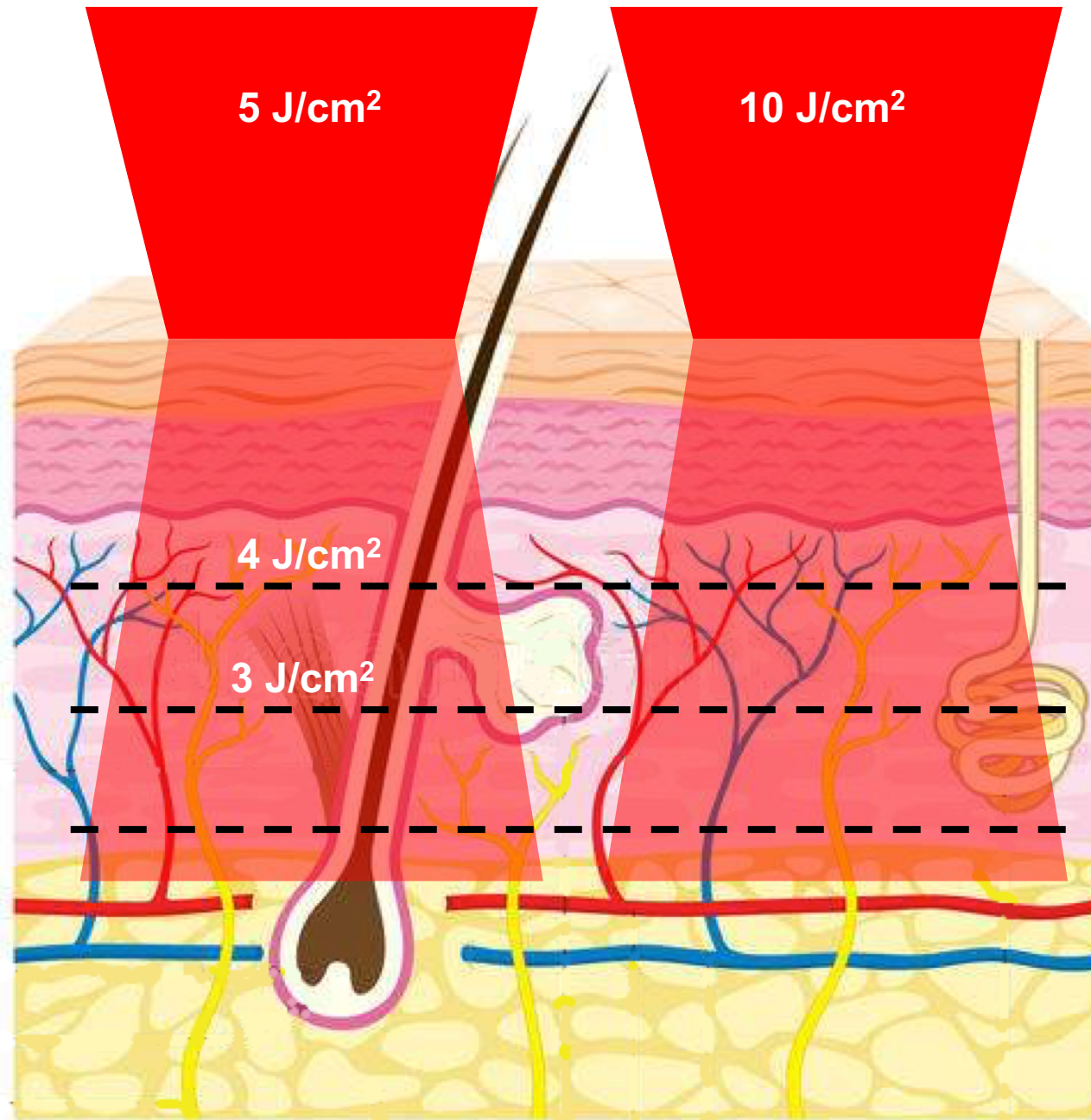
Same  
wavelength  
Same spot  
diameters

Different  
fluences at the  
skin surface



Same  
wavelength  
Same spot  
diameters

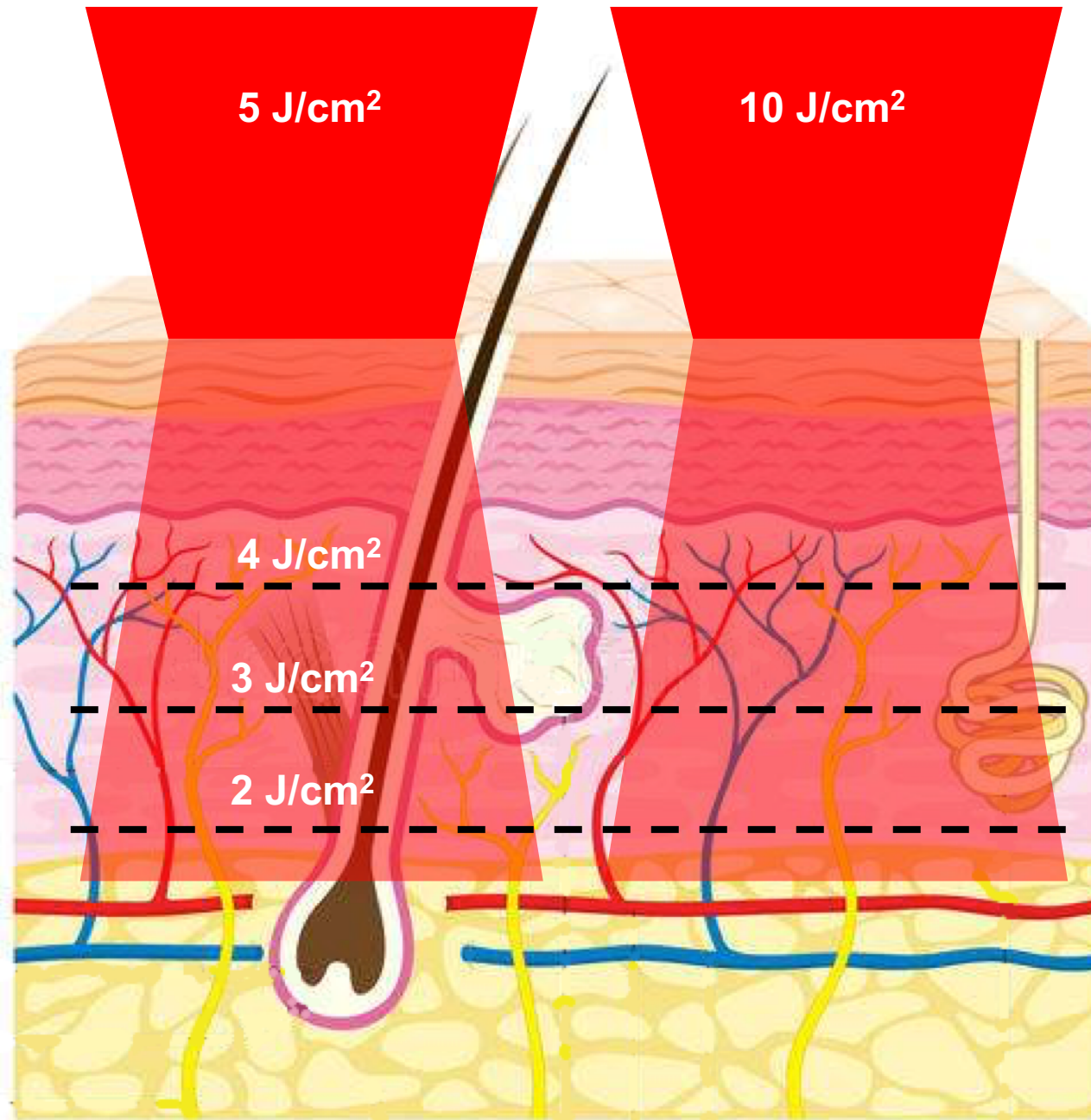
Different  
fluences at the  
skin surface





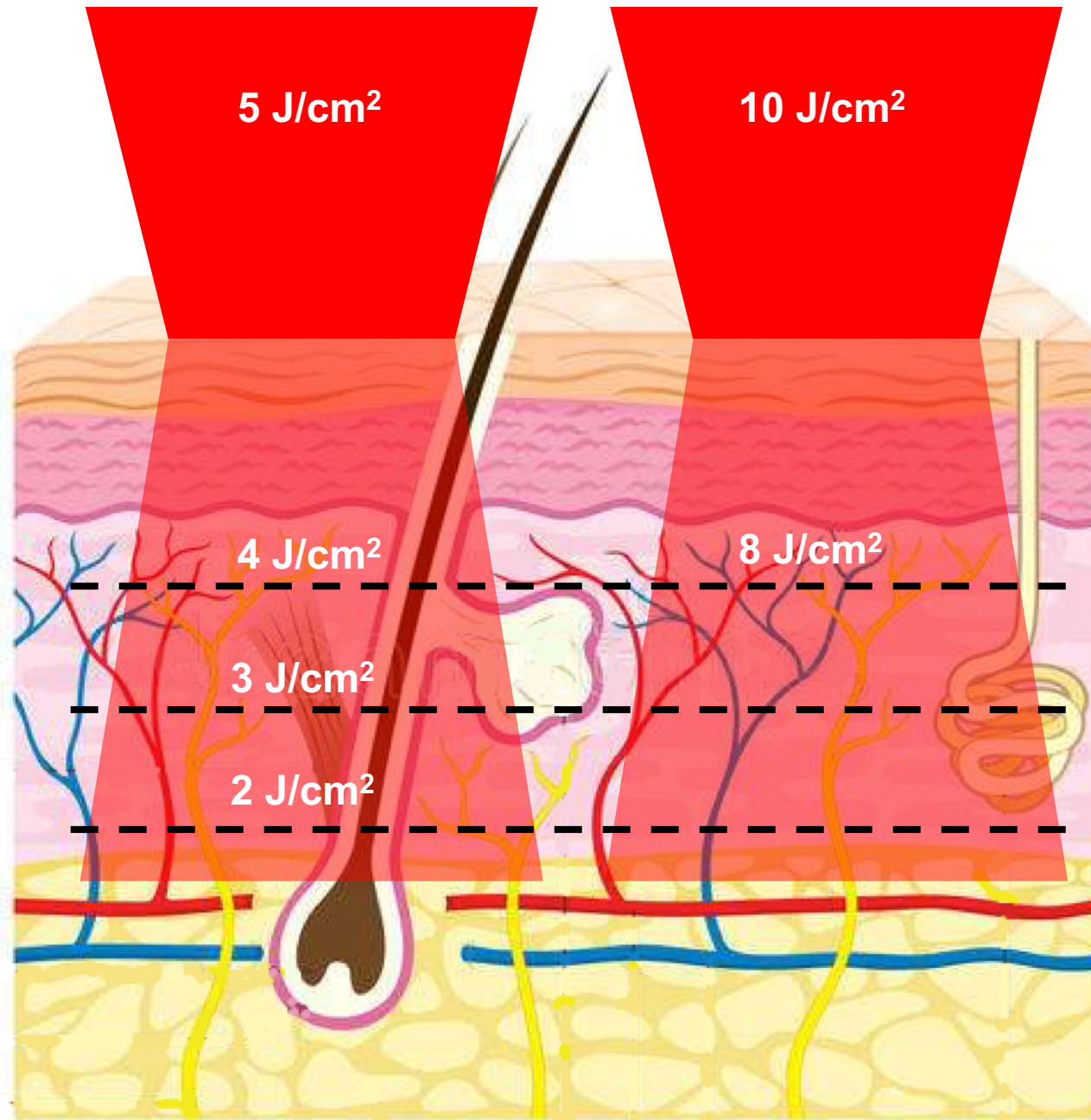
Same  
wavelength  
Same spot  
diameters

Different  
fluences at the  
skin surface



Same  
wavelength  
Same spot  
diameters

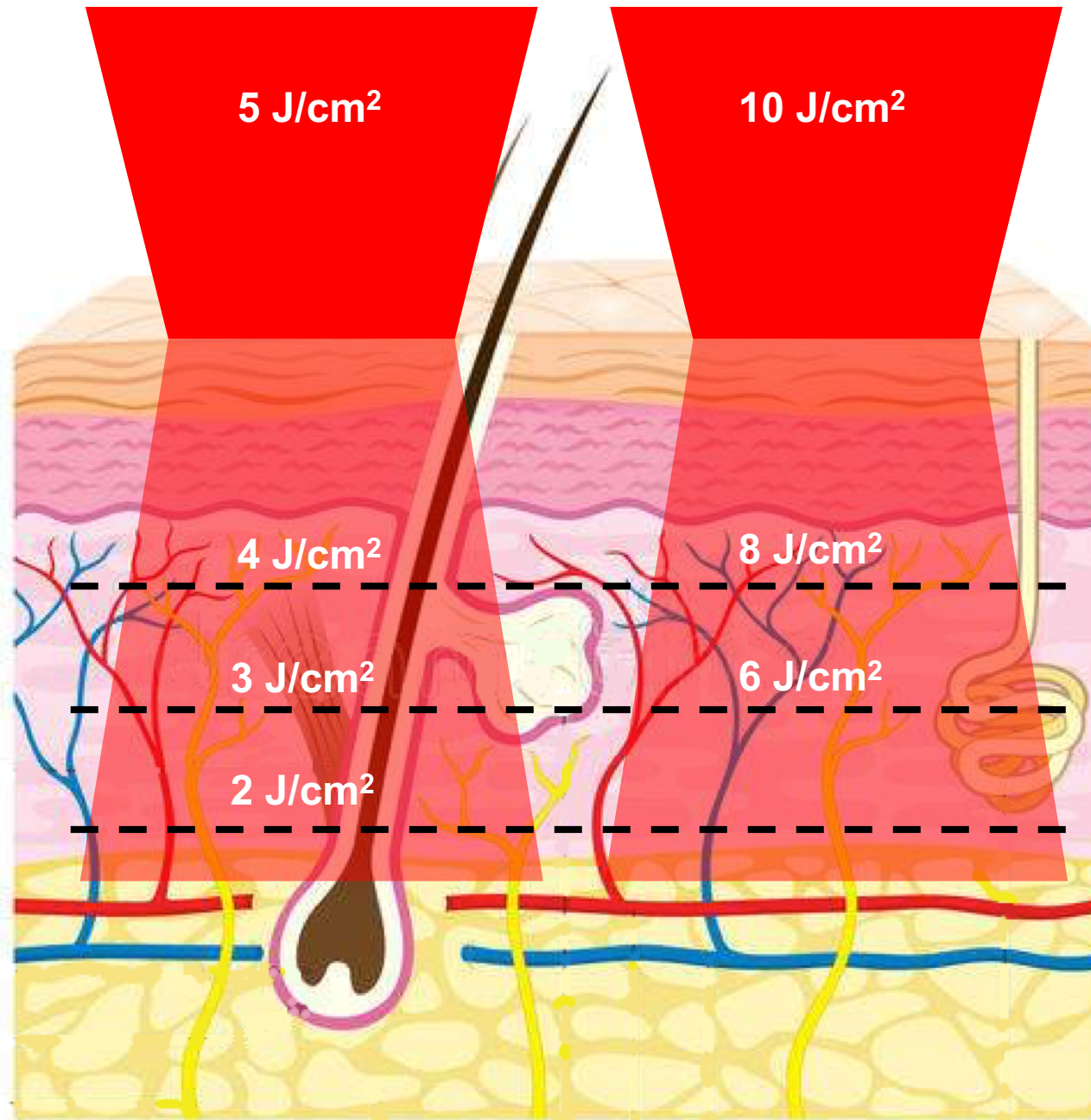
Different  
fluences at the  
skin surface





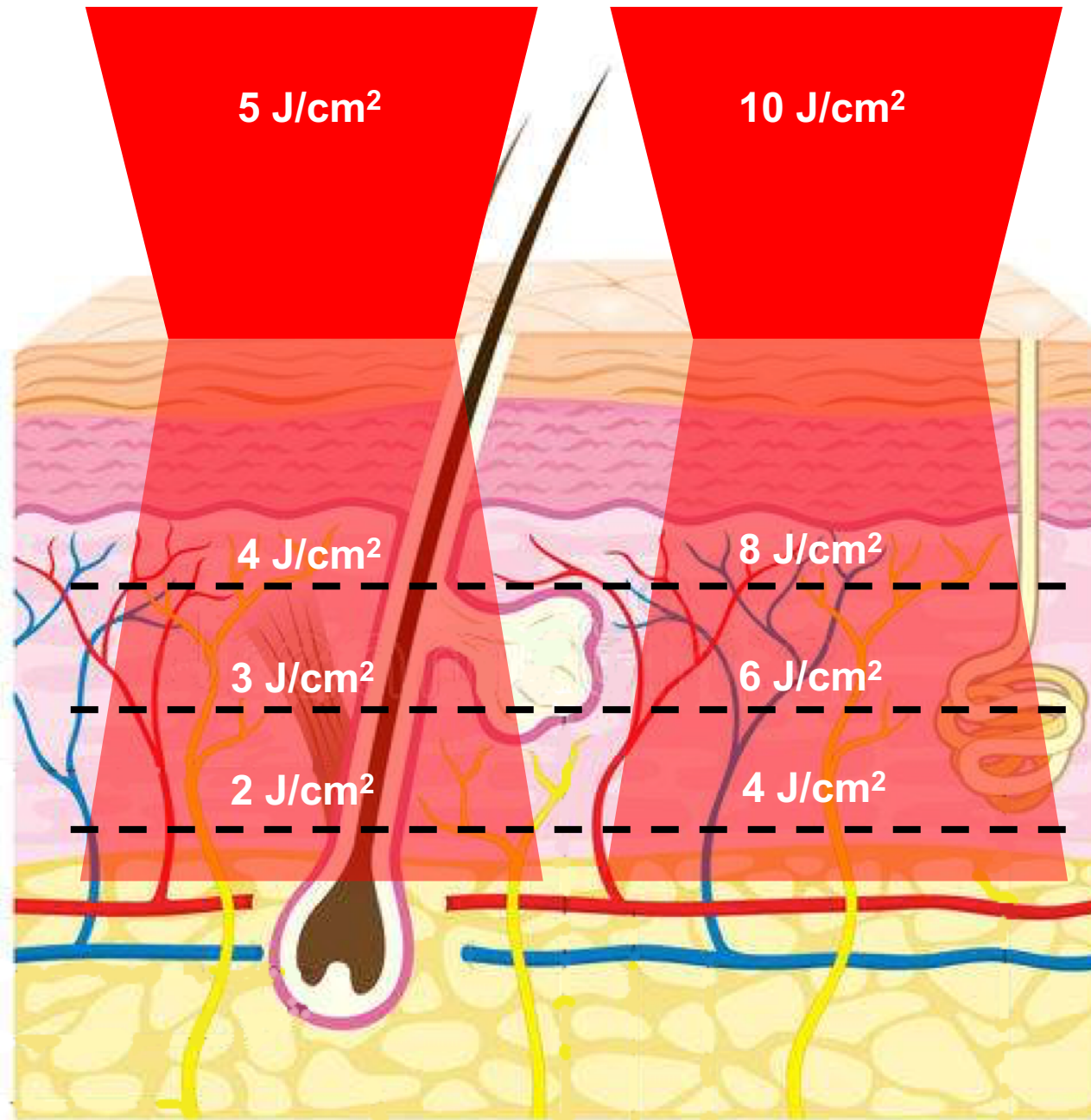
Same  
wavelength  
Same spot  
diameters

Different  
fluences at the  
skin surface



Same  
wavelength  
Same spot  
diameters

Different  
fluences at the  
skin surface



Not actual fluences!  
Those depend on other  
factors...





# Clinically Useful Penetration Depth

- Depends on....
  - Wavelength
  - Anisotropy
  - Spot diameter
  - Incident fluence



# Clinically Useful Penetration Depth

- A much more 'useful' definition for treatment purposes!!





# ‘Useful’ Penetration Depth

[The Laser-IPL Guys Site](#)