

## C4 Questions: Sunburn, DNA and cancer

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1. In sunshine which waveband predominates, UVA or UVB?
2. Which wavebands contribute most to sunburn?
3. Are patients with xeroderma pigmentosum abnormally sensitive to X-irradiation as well as UVR? Why?
4. Does UVR of less than 310nm penetrate the atmosphere?
5. When does UVR induced erythema peak?
6. Why does UVR induced erythema subside over time?
7. Name two biomarkers of skin cancer that follow acute UVR exposure
8. The term action spectrum refers only to DNA damage or erythema. True or false?
9. Why is sunburn so well demarcated?
10. UVA is the main causative waveband for skin cancer. Discuss.

### Answers: Sunburn, DNA and cancer

1. UVA is the dominant waveband in sunshine comprising over 90% of incident radiation.
2. UVB in natural sunshine is the main cause of sunburn, not UVA. (about 80% of erythema is due to UVB).
3. Read the section again! XP patients are principally sensitive to UVR.
4. Yes. Only UVR **below** 290nm is blocked by the atmosphere.
5. UVR induced erythema peaks between 8 and 24 hours.
6. DNA repair reduces DNA damage, and the erythema subsides.
7. Erythema and freckling.
8. False. You can have an action spectrum for any endpoint. Tanning, for example.
9. Sunburn reflects cellular damage, and is localised to where the damage occurs. Other causes of erythema may spread more widely reflecting deeper inflammation or neurogenic mechanisms ('axon reflex').
10. This is all subject to challenge, but we think UVB is the *main* cause of most types of skin cancer. For melanoma, UVA may be *relatively* more important than for other types of cancer (note the emphasis: relatively).