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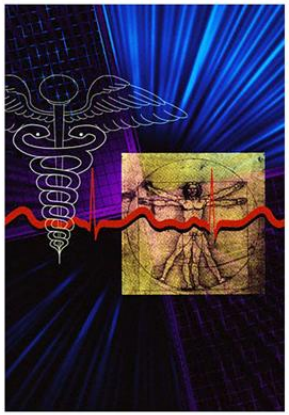

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Question of the Week

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Case History

- A 76-year-old male farmer presents with a 2-cm mass on the left side of his forehead. A biopsy reveals squamous cell carcinoma.
- Which one of the following causes the formation of pyrimidine dimers in DNA and is associated with the formation of squamous cell carcinoma?
  A. Aflatoxin B1
  B. Vinyl chloride
  C. UVC
  D. UVB
  E. Epstein-Barr virus

Answer

- The correct answer is D.

Explanation

- Ultraviolet rays are associated with the formation of skin cancers, including squamous cell carcinoma, basal cell carcinoma, and malignant melanoma.
- The ultraviolet portion of the spectrum (ultraviolet rays) is divided into three wavelength ranges: UVA (320 to 400 nm), UVB (280 to 320 nm), and UVC (200 to 280 nm). UVB is the wavelength range that is responsible for the induction of skin cancers.
- The carcinogenic property of UVB is related to the formation of pyrimidine dimers in DNA. UVC, although a potent mutagen, is not significant because it is filtered out by the ozone layer around the earth.
- Some DNA viruses and RNA viruses are associated with the development of dysplasia and malignancy.

- For example, infection with human papillomavirus (HPV), especially types 16 and 18, is associated with cervical dysplasia; Epstein-Barr virus (EBV) is associated with Burkitt's lymphoma and nasopharyngeal carcinoma; hepatitis B virus (HBV) and hepatitis C virus (HCV) are associated with primary hepatocellular carcinoma; and HHV-8 is associated with Kaposi's sarcoma.
- HTLV-I is an RNA retrovirus that is associated with the formation of a peculiar type of hematologic malignancy called adult T cell leukemia/lymphoma. These patients have malignant cells in their lymph nodes and blood. This malignancy is endemic in southern Japan and the Caribbean region.

The end

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