# THE EFFECT OF CHRONIC LOW-DOSE UVB RADIATION ON LANGERHANS CELLS, SUNBURN CELLS, UROCANIC ACID ISOMERS, CONTACT HYPERSENSITIVITY and SERUM IMMUNOGLOBULINS IN MICE

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Article first published online: 2 JAN 2008

DOI: 10.1111/j.1751-1097.1995.tb05276.x

**Photochemistry and photobiology**

**Volume 62, issue 2, pages 326- 332, August 1995**

**Abstract—** C3H mice were irradiated three times a week for up to 6 weeks with either 500 J/m$^2$ or 1000 J/m$^2$ broadband UVB (270–350 nm) or 3000 J/m$^2$ narrowband UVB (311–312 nm; TL01 source). Each dose was suberythemal to the mouse strain used. The number of Langerhans cells (LC) in the epidermis was reduced by over 50% after 2 weeks of irradiation with the UVB source and by 20% following TL01 irradiation. Continued irradiation for up to 6 weeks resulted in no further decrease in LC numbers in the case of the UVB source but a steady decline to 40% in the case of the TL01 source. Sunburn cells were detected following irradiation with both sources but the numbers were very low in comparison with acute exposure. Ultraviolet-B exposure resulted in doubling of the thickness of the epidermis throughout the 6 weeks of irradiation while TL01 exposure did not alter epidermal thickness. Conversion of *trans*- to ew-urocanic acid (UCA) was observed with both UVB and TL01 sources. The percentage of *cis*-UCA started to return to normal after 4 weeks of TL01 exposure despite continued irradiation. As observed following a single exposure, the contact hypersensitivity (CH) response was significantly reduced following 6 weeks of UVB irradiation but was unaffected by TL01 exposure, indicating no correlation between *cis*-UCA levels and CH response. Total serum immunoglobulin levels remained unchanged throughout the 6 weeks of UVB or TL01 irradiation but IgE titers significantly increased in all cases in the first 2 weeks of irradiation, indicating a possible shift to a $T_{H2}$ cytokine profile. The IgE levels started to return to normal at later times. Thus chronic broadband UVB exposure induces a number of cutaneous and systemic responses that are likely to be dose dependent, while chronic TL0I exposure induces only some of the these responses