Synopsis of Original Research Paper

# Sunscreen and Induction of Apoptosis upon Mammalian cells Induced by Natural Sunlight

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An outbreak of skin cancer may be caused by exposure of ultraviolet light in the sunlight through induction of apoptosis on skin cells. Shielding the skin from the sunlight, especially from the UV-B light by use of sunscreen is thought to be important to escape the harmfulness. However, action spectrum for the induction of apoptosis by the ultraviolet light is not well known. To determine the action spectrum of apoptosis upon mammalian cells, L5178Y cells were used, and the wavelength dependence of the apoptosis exposed to ultraviolet light was investigated using monochromatic lights from the Okazaki Large Spectrograph (OLS) at the National Institute of Basic Biology (INBB), Okazaki, quasi monochromatic light from filtrated lights by mercury lamps or fluorescent lamps, and from natural sunlight. Cells were exposed to ultraviolet light at different wavelengths in the UV-A, -B, and -C regions, and the frequencies of apoptotic cells in total cells were determined with chromatin condensation after fluorescent staining following adequate post-incubation after UV exposure. The light-exposure level used to induce apoptosis in 10% of the cells were 24 J/m2, 182 J/m2, and 141 kJ/m2 at 280, 300, and 320 nm, respectively. The measured action spectrum for apoptosis induction showed a slightly steeper curve to that for the minimum erythema dose (MED). The peak of the effective action spectrum for induction of apoptosis to sunlight i.e. the products of spectra for apoptosis induction or MED and solar-light intensity on the ground, was found at 303 nm, which was also took place in shorter wavelengths region than that for MED. The difference between the effective action spectrum may be caused by the shielding of the skin keratinocytes locating just above the target cells.