UVB Damage is More Harmful to DNA than UVA

UVB Rays are Killers

The results are in. The most damaging form of UV light is UVB, not UVA. This is not to say that UVA is safe - it too can cause cancer. Ultraviolet (UV) rays have been indisputably acknowledged as carcinogens.

Types of Rays

There are three types of ultra violet rays: UVA, UVB, and UVC.
UVA rays have a slow effect on the skin, a longer wave length and are poorly absorbed by the ozone layer. They are weaker than UVB but 1,000 times more common.

UVB rays have a medium wave length and are 500-800 times stronger than UVA rays. They cause visible damage, commonly seen as redness and blistering and are a major cause of sunburn and skin cancer.

While UVC rays are the most powerful, at present they do not penetrate our atmosphere. If they did, we would all be in serious trouble as they are capable of burning through the skin.

An interesting fact: most sun damage is actually the result of normal sunlight exposure obtained on a daily basis through our normal activities (i.e., driving, shopping, walking).

New Research Findings

Research published in July, 2008 by the Federation of American Societies for Experimental Biology (FASEB) acknowledges that while both types of UV rays are harmful, the body finds it harder to repair the damage, including harm to DNA caused by UVB rays. Simply put, UVB rays are more likely to cause skin cancer, ageing skin and other forms of extrinsic aging. The FASEB is arguably the most cited biology journal. With the ever increasing rate of skin cancers, learning the mechanisms of what exacerbates tumor growth can lead to the creation of a new generation of sun care products that will offer more protection.

According to the lead researcher, “this study fills the gaps in the knowledge of mechanisms involved in sunlight associated skin cancers, which cover various aspects of DNA damage and repair and genetic alterations”.1

A practical application of these findings will be the identification of criteria to determine the efficacy of consumer products such as sunscreens in helping to prevent or minimize damage to the skin caused by the sun.

Dr. Gerald Weissman, editor of The FASEB Journal believes this research will play a major role in the development of more effective sunscreens and after sun products. He also feels it will have an impact in studying how sun exposure leads to tumor formation.

In technical terms, despite the predominance of UVA relative to UVB in overall sunlight, mutations to the fibroblasts caused by UVB were more prevalent. Solar mutations specific to UVB rays were also more difficult for the body to repair, thereby causing more damage to the skin.

The carcinogenicity of UVB is due to the ability of its waveband to induce promutagenic DNA lesions. This study is vital in that it paves the way for further research that will help unravel the underlying mechanisms of sunlight induced carcinogenesis.1

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Important: Select a sun care product that is broad spectrum and has both physical and chemical protection along with antioxidants to help fight free radicals. Do not be misled by high SPF ratings.

By Carol and Rob Trow

1. The FASEB Journal. 2008;22:2379-2392.