Action spectrum of sun skin damage documented

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Human skin structure. Credit: Wikipedia

Scientists document for the first time the DNA damage which can occur to skin across the full range of ultraviolet radiation from the sun.

As pharmacists warn that the public is confused by sunscreen labelling, scientists at Newcastle University have detailed the DNA damage which

can occur to skin across the full range of ultraviolet radiation providing an invaluable tool for sun-protection and the manufacturers of sunscreen.

Testing on human skin cell lines, this study published today in The *Journal of Investigative Dermatology*, documents the action spectrum of ultraviolet damage in cells derived from both the upper layer (dermis) and lower layer (epidermis) of the skin.

This provides an invaluable tool for sun protection and for the manufacturers of sunscreen to develop and test products so that they can provide protection to both layers.

Our skin ages due to the constant exposure to sunlight as ultraviolet radiation comprising UVA and UVB rays from the sun penetrates cells and increases the number of damaging free radicals, especially the reactive oxygen species. Too many reactive oxygen species can be harmful because they can damage the DNA within our cells.

Over time, this can lead to the accumulation of DNA damage, particularly in mitochondria – the batteries of the cells - which speed up ageing and destroy the skin's supportive fibres, collagen and elastin, leading to wrinkles. Studies strongly suggest the damage caused by reactive oxygen species may also initiate and exacerbate the development of skin cancers.

Mark Birch-Machin, Professor of Molecular Dermatology at Newcastle University said: "Because we were able to analyse the full spectrum of UVA and UVB induced sunburnt DNA damage in the batteries of human skin cells this is an invaluable tool for the cosmetic and pharmaceutical industries and for anti-ageing studies."

The Engineering and Physical Sciences Research Council funded Dr

Jennifer Latimer as a CASE PhD Student at Newcastle University for the work alongside a funding award for the collaboration with Proctor and Gamble.

Dr Latimer said: "It is satisfying to think that four years of scientific research has resulted in an outcome that is potentially beneficial, not only to the scientific community but also to industry and the general public."

More information: "Determination of the Action Spectrum of UVR-Induced Mitochondrial DNA Damage in Human Skin Cells." *Journal of Investigative Dermatology*. DOI: 10.1038/jid.2015.194

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