

Oncology News



.....*More than medicine*

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Redheads and Melanoma; No Sun Required

By Thomas P. Trezona, MD

We have known for years that people with fair skin and light-colored hair are at significantly greater risk for skin cancers and melanoma. New research now indicates that even having the skin pigment associated with red hair in fact can cause melanoma REGARDLESS of sun exposure! Called pheomelanin, the pigment present in those with red hair, causes reactive oxidative damage to the DNA of melanocytes and induces carcinogenesis, independent of ultra-violet rays.

Background information: Skin pigments are controlled by the melanocortin 1 receptor (MC1R) in melanocytes. In dark-haired people, MC1R is activated by UV exposure, producing eumelanin, which shields the skin from harmful UV effects. In redheads, the MC1R is inactive, resulting in the production of the red/yellow pheomelanin pigment that provides weak UV shielding. Absolutely no eumelanin is produced in redheads.

Data: A recent experiment was conducted using mouse models. Researchers developed a mouse

model with an inactivated MC1R receptor and searched for the conditional expression of BRAF, the most common melanoma oncoprotein.

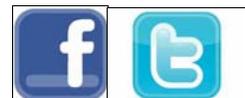
(The single expression of this oncoprotein causes benign mole development). The combination of BRAF plus red hair produced a high frequency of melanoma in the absence of UV exposure. Analysis of the mouse skin showed that pheomelanin (red pigment) produced a reactive oxygen species that damaged the DNA of melanocytes and induced carcinogenesis. The researchers then developed an albino mouse which could not produce pheomelanin. These mice developed dramatically fewer melanomas. A group of black-haired mice with a high ratio of eumelanin to pheomelanin also developed few melanomas.

Conclusion: It appears the eumelanin chemically "cages"



People who haven't red hair don't know what trouble is. - Anne of Green Gables

the pheomelanin, neutralizing its oxidative damage. Although sunscreens clearly protect from other forms of skin cancer, there is a UV-independent risk for developing melanoma in redheads. Additional strategies are clearly needed for skin protection from the oxidative damage inherent to red hair pigment in the skin. Going forward, it would be prudent to be extra careful when educating and monitoring patients with naturally red hair about any suspicious skin changes.





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