Genetic data shows that skin cancer risk includes more than UV exposure

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It's common knowledge that excessive UV exposure from sunlight raises your chances for skin cancer, but predicting whether someone will actually develop skin cancer remains difficult. In a new research report, scientists from the University of Alabama at Birmingham (UAB) and the University of Wisconsin–Madison show that the risk for skin cancer involves numerous genetic factors including family history, ethnicity, and genetic variations specific to each individual. Using these factors, the researchers developed a more precise model for assessing risk, which is published in the December 2012 issue of the journal *Genetics*.

"We hope this study will ultimately contribute toward a better understanding of the genetics of complex traits and diseases," said Ana Inés Vázquez, PhD, lead author of the study from UAB's Department of Biostatistics. "Such an understanding is essential for the development of methods that can be used for early and improved prediction of genetic predisposition to diseases."

To make this discovery, the scientists used phenotypic and genetic information from more than 5,000 familial participants in the Framingham Heart Study to develop various models for assessing skin cancer risk. The researchers' most basic risk evaluation model included standard risk factors such as sex. Additional predictive models were developed by adding information on family history, ethnicity, and data from 41,000 genetic markers across the human genome. The predictive power of each model was evaluated, with the best prediction accuracy obtained from models that include all predictive risk factors—those

standard risk factors plus family history, ethnicity and genetic markers.

"Although there is no doubt that sun exposure increases your risk for skin cancer," said Mark Johnston, Editor-in-Chief of the journal *Genetics*, "it isn't clear how much of a risk it poses to each individual. This new model for assessing risk should prove useful to health care providers and public health officials, who play a crucial role in educating people about preventing skin cancer."

More information: Ana I. Vazquez, Gustavo de los Campos, Yann C. Klimentidis, Guilherme J. M. Rosa, Daniel Gianola, Nengjun Yi, and David B. Allison, A Comprehensive Genetic Approach for Improving Prediction of Skin Cancer Risk in Humans, *Genetics*, December 2012 192:1493-1502

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