Public release date: 8-Jun-2007

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Sun exposure early in life linked to specific skin cancer gene mutation

CHAPEL HILL - Skin cancers often contain different gene mutations, but just how these mutations contribute to the cause of melanomas has been a mystery.

A new clue comes from scientists at the University of North Carolina at Chapel Hill Schools of Medicine and Public Health. Their research indicates that early life sun exposure, from birth to 20 years old, may specifically increase the risk of melanomas with BRAF gene mutations. A different mutation, on the NRAS gene, was found in patients who had sun exposure later in life (between ages 50 to 60 years old). The results indicate that different subtypes of melanoma are associated with different risk factors

"The findings suggest that melanoma subtypes have different causes. This is important for learning more about how to prevent and treat skin cancer," said Dr. Nancy Thomas, associate professor of dermatology in the UNC School of Medicine, a member of the UNC Lineberger Comprehensive Cancer Center and lead author of the study. This finding is expected to strengthen current recommendations to protect children from sun exposure in order to prevent melanoma, Thomas said.

The study, published in the May 2007 edition of the journal Cancer Epidemiology Biomarkers and Prevention, presents some of the first data to link early life sunlight exposure to a specific mutation in melanomas.

Researchers interviewed 214 melanoma patients in North Carolina about their risk factors for melanoma and about the various places they had lived. Each patient's UV sun exposure was estimated from their residential history and satellite-base measurements. DNA from the patients' melanomas was then analyzed for mutations.

Patients with melanomas that contained the BRAF mutation, found in about half of all melanomas, were more likely to report high levels of sun exposure before age 20. People with

the NRAS mutation were more likely to have had high exposure between the ages of 50 and 60. About 15 percent of melanomas contain the NRAS mutation.

The findings come from the initial phase of an ongoing study that will ultimately include more than 1,000 patients from the U.S. and Australia. The research was funded by the Dermatology Foundation, the National Cancer Institute and the UNC Lineberger Cancer Center.

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Other UNC authors of the study are: Dr. Kathleen Conway, assistant professor of epidemiology; Dr. Robert C. Millikan, professor of epidemiology; research specialist Sharon Edmiston; research specialist Audrey Alexander; clinical research coordinator Dianne Mattingly; applications specialist Chiu Kit Tse; and research technician Dr. Dawn Tolbert, all of the department of epidemiology; of the department of dermatology, Dr. Pamela Groban, professor of dermatology and pathology, and research specialist Honglin Hao; of the department of surgery, Dr. David Olilla, associate professor of surgery. All are affiliated with the UNC Lineberger Comprehensive Cancer Center.

Marianne Berwick of the University of New Mexico was also a co-author. Other co-authors at Memorial Sloan-Kettering Cancer Center in New York were Dr. Klaus Busam, Dr. Colin B. Begg and Amanda Hummer. Dr. Julia Lee-Taylor from the National Center for Atmospheric Research also was a co-author.

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