UNC Lineberger News Release

September 30, 2010

UNC Scientists Confirm Four Molecular Subtypes for Most Common Lung Cancer

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CHAPEL HILL, NC - Squamous cell carcinoma is one of the most common types of lung cancer, but scientists haven't been sure what triggers its development. UNC researchers have taken the first step towards a better understanding of how the disease develops at the molecular and cellular level, for the first time definitively documenting at least four molecular subtypes of squamous cell cancer.

These subtypes provide clues as to the origin of the tumor, differences in patient outcomes, and potential differences in therapies that offer new paths for physicians seeking more targeted approaches to treating this form of cancer.

Neil Hayes, MD, MPH, MS, associate professor of medicine, UNC Lineberger Comprehensive Cancer Center member, and study senior author, explains, "These findings are really exciting for those of us who treat patients. We have seen therapies for breast cancer advance since subtypes were defined and each time we are able to provide this analysis for a type of cancer, it opens the door toward more personalized treatments and potentially better patient outcomes."

The UNC scientists have found evidence that tumors arise from different cells within the lung, suggesting a different biological origin among patients currently treated as a single group. The investigators also showed that genes associated with the subtypes have previously been described suggesting that different therapies might be more effective according to the subtype. Additionally, scientists provided data that these subtypes could be detected using analysis of tumor samples or blood.

These types were defined using meta-analysis techniques, from which investigators assembled nearly 400 patient samples to confirm statistically significant and independently confirmed tumor variants. The investigators then tested these molecular subtypes using UNC patient tumor specimens. The four subtypes - primitive, classical, secretory, and basal – are descriptors of their molecular behavior. The primitive subtype correlates with worse patient survival and recurrence rates, suggesting that more aggressive therapies may be more appropriate for these patients.

The study was published in the September 29 online issue of the journal Clinical Cancer Research, a publication of the American Association of Cancer Research.

Hayes is director of clinical bioinformatics for UNC Lineberger and director of the UNC Tumor Registry. Additionally, he is co-principal investigator of UNC Lineberger's The Cancer Genome Atlas grant.

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