

UNC Part of National Effort to Shape the Future of Cancer Research and Treatment

The University of North Carolina at Chapel Hill is one of twelve centers announced in September as part of an unprecedented large-scale, collaborative effort by the National Cancer Institute (NCI) and the National Human Genome Research Institute (NHGRI) to systematically characterize the genomic changes that occur in cancer.

The Cancer Genome Atlas Grant (TCGA) is a five-year award, expected to bring \$13 to \$20 million to UNC, which puts scientists from UNC Lineberger and their collaborators across campus at the center of a major push to provide a deeper, more systematic understanding of cancer.

"This project represents one of the most ambitious and challenging human genetics efforts to date, only rivaled by its predecessor, the Human Genome Project," said Dr. Charles Perou, associate professor of genetics, and pathology & laboratory medicine.

"It takes a comprehensive approach to the study of human cancers and applies multiple cutting-edge technologies to the same large set of tumors. The real power of this project is in the integration of these different genetic data types into a common framework that should provide a much more complete picture of why a tumor is a tumor," he added.

"Cancer genetics has been a key area for University Cancer Research investment, allowing us to diversify the technologic base needed for this project. This phase of TCGA will yield many new cancer discoveries that may change the face of clinical cancer care in the near future," said UNC Lineberger Director Shelley Earp, MD.

The project has already yielded results. A study published in January by UNC Lineberger researcher D. Neil Hayes, MD, and his colleagues, suggests that the most common form of malignant brain cancer in adults, glioblastoma multiforme (GBM), is probably not a single disease but a set of diseases, each with a distinct underlying molecular disease process. The study provides a solid framework for investigation of future targeted therapies that may improve the near uniformly fatal prognosis of this devastating cancer.



Scott Randell, PhD and Neil Hayes, MD confer in the lab

UNC's specific focus is to characterize what genes are being expressed, and not expressed, in each tumor type studied. Using a methodology called "gene expression profiling," scientists get a very powerful look at a given tumor and can precisely determine what genes are "on" and what genes are "off". Cancers are typically caused by some genes being inappropriately on, and other genes being inappropriately off. Thus, being able to look at all genes at once and determine which are on is critical to a better understanding of tumor biology.

The UNC project team is headed by Drs. Charles Perou and Neil Hayes and includes a broad multi-disciplinary team that reflects the tremendous complexity and depth of the data collected, and the desire to extract as many biological insights out of this data as possible. Team members hail from seven different departments across UNC-Chapel Hill including Genetics (Drs. Derek Chiang and Piotr Mieczkowski), Medicine (Dr. Neil Hayes), Biology (Drs. Jason Lieb and Corbin Jones), Pathology (Drs. Charles Perou and Michael Topal), Statistics (Drs. Steve Marron, Yufeng Liu and Andrew Nobel), and Biostatistics (Drs. Wei Sun and Fred Wright).