# Gene expression-based prognostic signatures in lung cancer not ready for clinical use

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A review of published articles on gene expression-based prognostic signatures in lung cancer revealed little evidence that any of the signatures are ready for clinical use. Serious problems in the design and analysis of the studies were also found. The review was published online March 16, 2010 in the *Journal of the National Cancer Institute.*

To assess the progress made towards clinical application of these signatures, Jyothi Subramanian, Ph.D., and Richard Simon, D.Sc., of the Biometric Research Branch at the National Cancer Institute in Bethesda, Md., critically reviewed 16 relevant published studies from 2002 to 2009 that reported on the development of gene expression-based prognostic signatures for non-small cell lung cancer.

Those publications were evaluated for appropriateness of the study design, statistical validation of the prognostic signature on independent datasets, presentation of results in an unbiased manner, and demonstration of medical utility for the new signature beyond that obtained using existing treatment guidelines.

The reviewers found little evidence that any of the signatures are ready for clinical application. Many studies lacked statistical validation of data and reproducibility of the signatures and did not explain their actual medical utility. Also, none were successful in showing clear usefulness for the gene expression signatures over and above the known risk factors.

Flaws in design and analysis were also discovered. The reviewers write that many studies had a lack of clear specification of therapeutically relevant objectives, inappropriate patient selection, and poor documentation of important prognostic factors.

"We hope that future research in this important field will strive to move away from being another exercise in clinical correlation to one that truly makes an impact on widespread medical practice," the authors write.

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