

## Gene test could help lung cancer patients seeking treatment

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Scientists in Taiwan have developed a simple, five-gene test aimed at showing which lung cancer patients most need chemotherapy, as similar tests now do for people with breast cancer and lymphoma.

The experimental test needs to be validated in larger groups of patients, so widespread use is perhaps a few years away. However, it's already winning praise for its possible use in everyday hospital settings instead of in limited situations by people with special genetics training.

"This has the potential to be extremely helpful," said Dr. David Johnson, a lung cancer expert at Vanderbilt University and former president of the American Society of Clinical Oncology, the world's largest group of cancer specialists.

"It's further proof that understanding genetic signatures may be helpful in how we treat patients. It may even allow us to avoid treating some patients," or to pinpoint those who may not respond to current drugs and would be better off trying an experimental therapy, he said.

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Dr. Johnson had no role in the research, which was reported in Thursday's New England Journal of Medicine. The Taiwan test is much simpler than a different one involving dozens of genes described by Duke University researchers in the same medical journal last August.

Lung cancer is the world's top cancer killer. About 175,000 new cases and 162,000 deaths from it occur in the United States each year.

Most tumours are diagnosed after they have already spread beyond the lung. For the 20 per cent or so of patients whose cancers are found in an early stage, chemotherapy after surgery to remove the tumour can improve survival.

However, some of these early-stage patients have such a low risk of recurrence that chemo gives them only slightly better odds. Others turn out to have very aggressive tumours that prove fatal even though they are very small when detected. Right now, there's no good way to tell these groups of patients apart — size alone doesn't do it.

"The staging system pretty much needs to be trashed. It's imprecise, and it tells us nothing close to what the genomic, genetic material tells us" in terms of risk of recurrence and death, said Dr. Anil Potti, a scientist working on Duke's gene signature test.

The test devised by Hsuan-Yu Chen and colleagues at Taiwan University aims to give a better way to sort low- and high-risk patients.

The scientists analyzed 125 patients' tumour samples from patients with all stages of lung cancer and found 16 genes that seemed to raise or lower the odds of recurrence or death. Further analysis narrowed this down to five genes that formed a signature of risk.

They tested this signature on half of the samples and found a strong correlation to how well the patients actually fared. Median survival was 40 months for the lowest-risk group and 20 months for the highest-risk according to the strength of activity of the five genes. The median time until relapse also was significantly longer — 29 months versus 13 months — for the lowest-risk group.

Results were validated in another set of 60 patients. Doctors also tested the genes' prediction powers with information on 86 tumours that University of Michigan researchers used to try to develop their own gene profiling test. The Michigan researchers posted their information on the Internet, allowing the Taiwan scientists to test results in a largely Caucasian population in addition to their Asian one.

Researchers now must test more patients, assign chemotherapy based on the resulting risk scores, and track survival, Dr. Roy Herbst of the University of Texas' M.D. Anderson Cancer Center writes in an editorial accompanying the study in the medical journal.

"In breast cancer now, patients are being selected for chemotherapy based on studies like this," he noted. "We have to move to the next step" with lung cancer, he said.

The study was paid for by the National Science Council of the Republic of China and Advpharma, a Taiwan company, and one of the study authors is an employee.

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