Prediction of survival in early stage non-small cell lung cancer (NSCLC) by kinase activity profiles

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Study Design
Evaluate the prognostic value of kinase activity profiles to predict survival of NSCLC patients post surgery.
In this retrospective study a group of short term survivors vs long term survivors (< 24 months post diagnosis (n=22) and > 48 months (n=26)) was used. Tumor tissue cryosections of fresh frozen resection material were lysed and tested in the presence and absence of the protein tyrosine kinase inhibitor gefitinib on PamChip® arrays. 10 μg of protein lysate was used per array.

Key Findings
Phosphorylation profiles obtained in the absence of gefitinib did not distinguish between patients with short survival and long survival, whereas ratios of inhibited vs. non inhibited signals resulted in a classifier able to predict survival (figure 1). Interestingly, the inhibitory effects of gefitinib were stronger in patients with short survival times as compared to patients with long survival times.
Data were processed using PamGene’s BioNavigator bioinformatics package. Positive predictive value and negative predictive value for the classifier, predicting survival, were 71 % (20/28) and 70 % (14/20), respectively. Specificity and sensitivity were 77% (20/26) and 63 % (14/22) respectively. The error rate was 29% (figure 2).

"Author Quote"
The present study introduces a new biomarker discovery platform, which can be applied in drug development and personalized therapy of NSCLC.

Background
The prognosis of patients with non-small cell lung cancer (NSCLC) is poor, even in early stage disease. At present, no good diagnostic tests are available to identify early stage NSCLC patients with poor survival or to select patients that might benefit from specific adjuvant therapy.

Conclusion
This application note shows that kinase activity from surgical resected NSCLC tissues can be used to develop a classifier which can predict survival prognosis.

References:
Ruijtenbeek R. et al., J. Clin. Oncol. 28:7s, 2010 (suppl abstr 10642)