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Prognostic phenotypes of early-stage lung adenocarcinoma

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Shareable abstract (@ERSpublications)
Clinical-grade immunodetection of TP53, NF1, CD45, PD-1, PCNA, TUNEL and FVIII in tumour samples identifies two phenotypes of resected lung adenocarcinomas that display different prognosis and can be used for patient management and trial design https://bit.ly/3DpM5Ll

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Abstract

Background Survival after curative resection of early-stage lung adenocarcinoma (LUAD) varies and prognostic biomarkers are urgently needed.

Methods Large-format tissue samples from a prospective cohort of 200 patients with resected LUAD were immunophenotyped for cancer hallmarks TP53, NF1, CD45, PD-1, PCNA, TUNEL and FVIII, and were followed for a median of 2.34 (95% CI 1.71–3.49) years.

Results Unsupervised hierarchical clustering revealed two patient subgroups with similar clinicopathological features and genotype, but with markedly different survival: "proliferative" patients (60%) with elevated TP53, NF1, CD45 and PCNA expression had 50% 5-year overall survival, while "apoptotic" patients (40%) with high TUNEL had 70% 5-year survival (hazard ratio 2.23, 95% CI 1.33–3.80; p=0.0069). Cox regression and machine learning algorithms including random forests built clinically useful models: a score to predict overall survival and a formula and nomogram to predict tumour phenotype. The distinct LUAD phenotypes were validated in The Cancer Genome Atlas and KMplotter data, and showed prognostic power supplementary to International Association for the Study of Lung Cancer tumour–node–metastasis stage and World Health Organization histologic classification.

Conclusions Two molecular subtypes of LUAD exist and their identification provides important prognostic information.