Cell block as a surrogate for programmed death-ligand 1 staining testing in patients of non-small cell lung cancer

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Introduction
Programmed death-ligand 1 (PD-L1) staining has been used to guide the proper use of immune checkpoint inhibitors in clinical practice. This study aims to investigate the feasibility of cytological cell block samples for PD-L1 staining in non-small cell lung cancer (NSCLC).

Methods
Paired cytological cell block and surgical resection samples were consecutively collected from January 2016 to February 2017 in Shanghai Pulmonary Hospital, Tongji University. Patients who have not received systemic therapy or radiation was included. PD-L1 expression was quantified by using two trial-validated PD-L1 assays (28-8 and SP142).

Results
A total of 112 pairs of specimens were collected, including 79 (63.2%) adenocarcinomas and 28 (25.0%) squamous cell carcinomas. PD-L1 expression was positive in 78.6% and 58.9% by using the TPS cutoff of 1% for 28-8 and SP142 assays in surgical samples respectively, while it was 67.9% and 25.0% in cytological cell block samples.

Cytology specimens showed fair to substantial concordance of PD-L1 expression compared with surgical resection for both antibodies’ staining (κ ranges from 0.377 to 0.686). However, as the tumor cells in the specimen increased, PD-L1 expression consistency increased. PD-L1 expression was almost perfect concordant with various cutoffs in cell blocks with abundant cellularity (28-8: tumor cells over 400; SP142: tumor cell over 500).

Conclusion
Cytological cell block specimens may serve as a surrogate for PD-L1 staining in patients of NSCLC in the situation that more than 400-500 cancer cells were contained.