their eligibility and predict responsiveness for immune-checkpoint inhibitors. Lung cancer is frequently diagnosed on formalin fixed paraffin embedded (FFPE) tissue, evidences are present in literature which showed high concordance of cytology samples with paired biopsies. However liquid based cytology (LBC) processed specimens have not been tested for PD-L1 expression. **Method:** Immunohistochemistry using the anti-PD-L1 clone SP263 was performed on BD SurePath LBC processed bronchial washing and brushing smears and paired FFPE endobronchial biopsy specimens. The presence of 100 viable tumor cells was considered adequate for PD-L1 testing. Staining was interpreted positive if membranous and/or cytoplasmic protein expression at any intensity greater than background staining was detected in at least 25% of tumor cells. **Result:** There were 26 patients with 13 adenocarcinomas and 13 squamous cell carcinomas which were diagnosed by bronchial brushings, washings and concurrently obtained endobronchial biopsy. Twelve out of total 26 biopsies showed cytoplasmic and membranous PD-L1 positivity in >25% tumor cells (46%). Corresponding LBC smear showed PD-L1 positivity in 9 cases establishing concordance of 88.4%. No negative case was positive on cytology. However, there were following challenges while interpreting PDL1 IHC on LBC processed smears: 1. Thick clusters of cells: LBC can cause rounding up of epithelial cells and create thick clusters of tumor cells. Therefore, it was necessary to see under higher magnification (40x) for proper interpretation of membrane staining. 2. Identification of tumor cells: Although identification of tumor cells was done before PD-L1 staining, after staining they were interpreted only on higher magnification to better differentiate them from alveolar macrophages. 3. PD-L1 staining in macrophages: Five cases showed very strong cytoplasmic positivity in macrophages. Since tumor cells showed cytoplasmic and membranous positivity it was easy to differentiate tumor cell positivity from macrophage positivity. Necrotic background in one case stained strongly with PD-L1 immunocytochemistry. 4. Nuclear positivity of PD-L1 positivity: One case, where corresponding biopsy was positive for PD-L1 IHC, showed aberrant nuclear positivity. **Conclusion:** PD-L1 IHC can be performed on LBC processed smears. Though there are challenges in interpretation of immunoexpression inherent to the LBC smears, they can be used in situations when histology material is not available. Future studies are needed to determine their ability to predict response to immunotherapy. **Keywords:** PD-L1, lung cancer, immunocytochemistry

**P1.09-04**

Optimization of PD-L1 Testing Specimen Flow in the Greater Hamilton, Ontario Region

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**Background:** Immunotherapy targeted at the programmed cell death 1 (PD-1) receptor and its ligand (PD-L1) is a new treatment option for non-small cell lung cancer (NSCLC). Immunohistochemistry (IHC) for the PD-L1 protein has been shown to predict response. The 22C3 IHC assay is the only clinically validated PD-L1 test. We present the Hamilton, Ontario, Canada experience of local PD-L1 analysis using the 22C3 assay including both histology and cytology specimens. **Method:** All data for requests for PD-L1 testing from within Hamilton were collected for one year. Unstained slides were cut for IHC analysis. Both histology and formalin fixed cytology specimens were accepted. Slides were sent for PD-L1 staining centrally at Dynacare in Bowmanville, Ontario, Canada. IHC interpretation was done in Hamilton. The assay was positive if ≥50% of tumour cells (TCs) had any intensity staining. The assay was negative if no TCs had staining. The assay was interpreted as low positive if 1-49% TCs had any intensity staining. Samples with less than 100 cells were considered inadequate. Turn around-time was defined as the accession date to PD-L1 sign out date. **Result:** 401 samples were evaluated; 108 cytology (C) and 293 histology (H). 36% of samples tested positive (43%:C;33%:H); 20% of samples tested low positive (14%:C;23%:H); 39% of samples tested negative (29%:C;42%:H). 5% were insufficient for evaluation (15%:C;1%:H). Chi-squared analysis identified a statistically significant (χ² < 0.02) difference in the distribution of test results comparing histology and cytology. The mean turn-around-time (TAT) was 28.9 days (range 12-144). TAT varied by hospital of origin. **Conclusion:** Our cohort mirrors findings in the literature and demonstrates that the 22C3 assay for PD-L1 can be done on both histology and cytopathology specimens; however, the insufficient rates are higher for cytopathology. Cytopathology specimens have a higher PD-L1 positivity rate, a finding that may reflect differences in tumour biology and/or stage in this subgroup. Turnaround times were different based on the hospital of origin, and suggest centralized specimen collection or use of dedicated thoracic pathologists may be advantageous. Correlation with clinical outcomes on our cytology cases will be presented in a separate abstract. **Keywords:** quality improvement, PD-L1, biomarker testing

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Why does PD-L1 (22C3) expression rate show difference among regional hospitals?

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**Background:** The immune checkpoints inhibitors, such as anti-programmed cell death 1 (PD-1) receptor antibodies and anti-PD-L1 (its major ligand against PD-1) were applied for several advanced cancer. On 2017, Pembrolizumab was approved for non-small cell lung cancer (NSCLC) as 2nd immune checkpoint inhibitor in Japan. At same time, immunohistochemical examination by anti-PD-L1 antibody (22c3) was approved as companion diagnostic staining for Pembrolizumab treatment. However, PD-L1 expression rate shows quite difference among hospitals in routine clinical examination. The purpose of this study is probing the reason of the difference in each hospital. **Method:** The questionnaire about PD-L1 staining was sent via e-mail to 14 Hospitals in Ibaraki prefecture, Japan. The questionnaire included PD-L1 expression in each histology (adenocarcinoma (AD), squamous cell carcinoma (SQ), and other NSCLC, and fixation condition. **Result:** Eleven hospitals (A to K) answered with the questionnaire. Total staining cases were 651: ADs were 384, SQs were 185 and the other NSCLCs were 79. The rates of PD-L1 No expression showed 18% to 71% among each hospitals. (figure 1 and 2). **Conclusion:** The result of TPS is quite different from