BACKGROUND AND OBJECTIVES

**INTRODUCTION**

PD-L1 expression is predictive of immunotherapy benefit. However, tissue PD-L1 protein immunohistochemical testing can be fraught with tissue acquisition and heterogeneity limitations.¹ PD-L1 expression by RNA sequencing can be performed in both tissue and plasma with tissue PD-L1 protein correlations.² ³

**AIM**

What has not been well characterized is the correlation of plasma cfRNA PD-L1 and clinical outcomes with immunotherapy. Plasma cfRNA PD-L1 expression was evaluated and correlated with immunotherapy benefit in advanced non-small cell lung cancers (NSCLC).

METHODS

- Patients with inoperable/metastatic NSCLC at a single institution underwent standard of care plasma NGS testing performed in a CLIA/CAP accredited laboratory prior to initial treatment
- Cell-free RNA PD-L1 was also extracted from plasma via a patented LISA/linear in situ amplification process and expression assessed by PCR at the same CLIA/CAP accredited laboratory
- **IO cohort:** 16 patients with plasma cfRNA PD-L1 expression and advanced NSCLC treated with first-line immunotherapy (IO) regimens were identified and assessed for overall survival
- **Chemorx cohort:** 10 contemporary patients with plasma cfRNA PD-L1 expression and advanced NSCLC from the same institution who received first-line chemotherapy alone were identified and used as a non-immunotherapy overall survival comparison

RESULTS

**IO cohort**
- Median age 66 (range 54-85)
- 5 out of 16 patients had brain metastases
- 8 of 16 patients were treated with pembrolizumab
- 6 of 16 patients were treated with avelumab

**Chemorx cohort**
- Median age 68 (range 63-88)
- 4 out of 10 patients had brain metastases
- 6 of 10 patients were treated with pembrolizumab

At median survival of 15 months, 30% of IO cohort patients were alive with a 3-year landmark OS of 30%

CONCLUSIONS

- **Plasma cfRNA PD-L1 expression was predictive of a significant survival benefit of immunotherapy treatment over chemotherapy in a real-world patient population of advanced NSCLC in eastern North Carolina**
- The 3-year landmark OS of 30% parallels tissue PD-L1 predictive clinical trial outcomes
- The clinical utility of plasma cfRNA PD-L1 to overcome tissue acquisition and PD-L1 protein heterogeneity limitations and to study the dynamic nature of PD-L1 expression with non-immune cancer treatments and potential immunotherapy response monitoring are undergoing ongoing research

REFERENCES

1.) Munari et al. Journal of Thoracic Oncology, 2018
2.) Conroy et al. Journal for ImmunoTherapy Cancer, 2019
3.) 2018Ishiba et al. Biochemical and Biophysical Research Communications,