



# Plasma cell free RNA PD-L1 and Clinical Outcomes with Immunotherapy



S. Jayananda<sup>1</sup>, M. Muzaffar<sup>1</sup>, P. Namireddy<sup>1</sup>, N. Sharma<sup>1</sup>, and P. Walker<sup>1</sup>;  
 East Carolina University, Greenville, NC

## 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.<sup>1</sup> PD-L1 expression by RNA sequencing can be performed in both tissue and plasma with tissue PD-L1 protein correlations.<sup>2,3</sup>

## 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).

## METHOD

- 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

8 females/8 males  
 Median age 66 (54-85)  
 5 – sx brain mets  
 7 -- bone mets  
 8 -- ECOG PS ≥ 2  
 Non-Sq 75%/Sq 25%

### Chemorx cohort

10 males  
 Median age 67 (42-81)  
 2 – sx brain mets  
 3 -- bone mets  
 6 -- ECOG PS ≥ 2  
 Non-Sq 70%/Sq 30%

[As of August 2021, median f/u 33 months]

### IO Cohort

**Median OS 15 months**  
**30% 3-year OS**

### Chemorx Cohort

**Median OS 3 months**  
**10% 3-year OS**

**Log-rank test p-value = 0.0091**  
**HR 0.36 (95% CI, 0.13-0.99)**

Figure 1: Kaplan-Meier OS curves of the IO and chemorx treated plasma cfRNA PD-L1 expressing patients

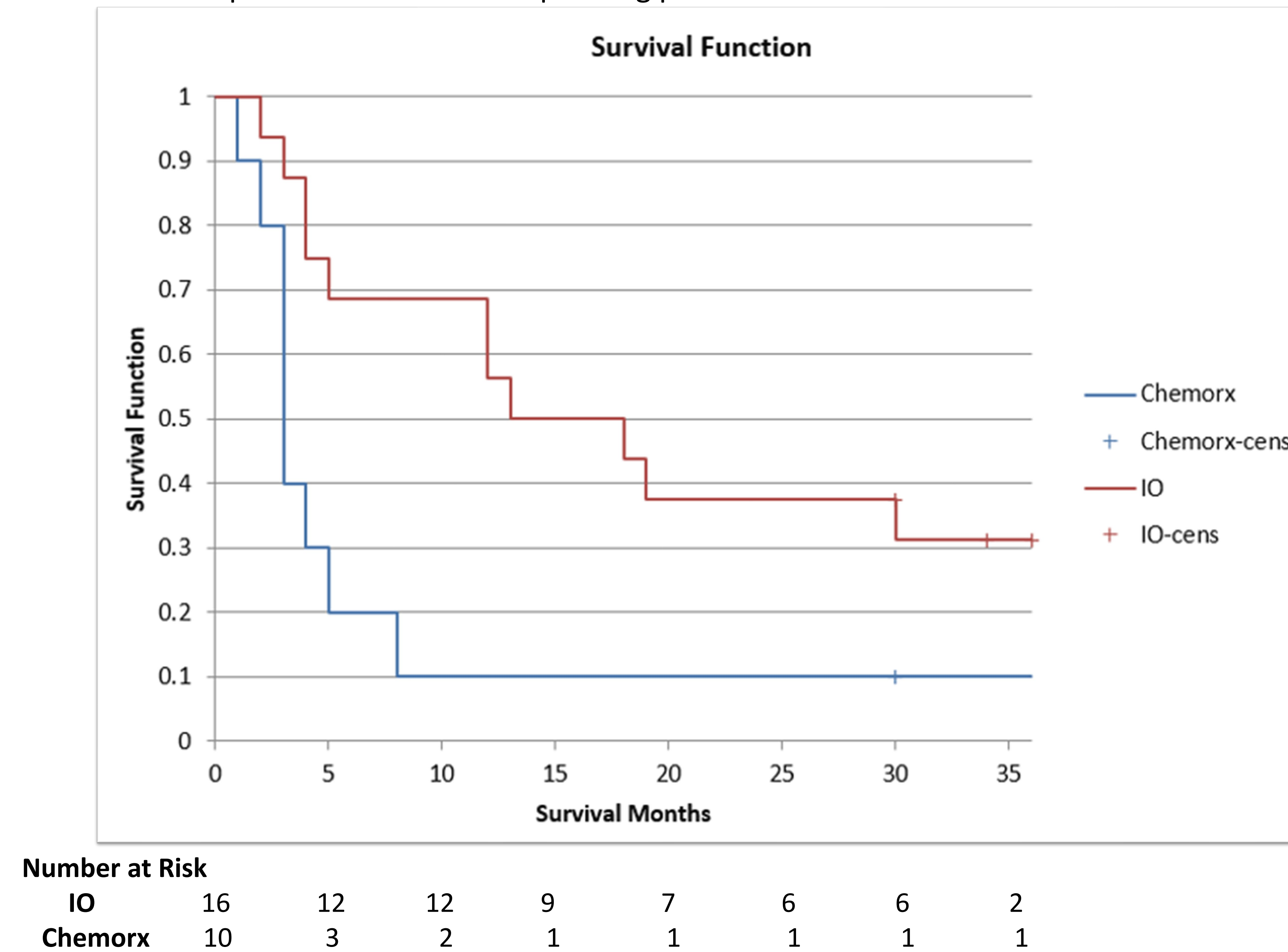


Figure 2: OS of IO treated patients ECOG PS 1 versus PS ≥ 2

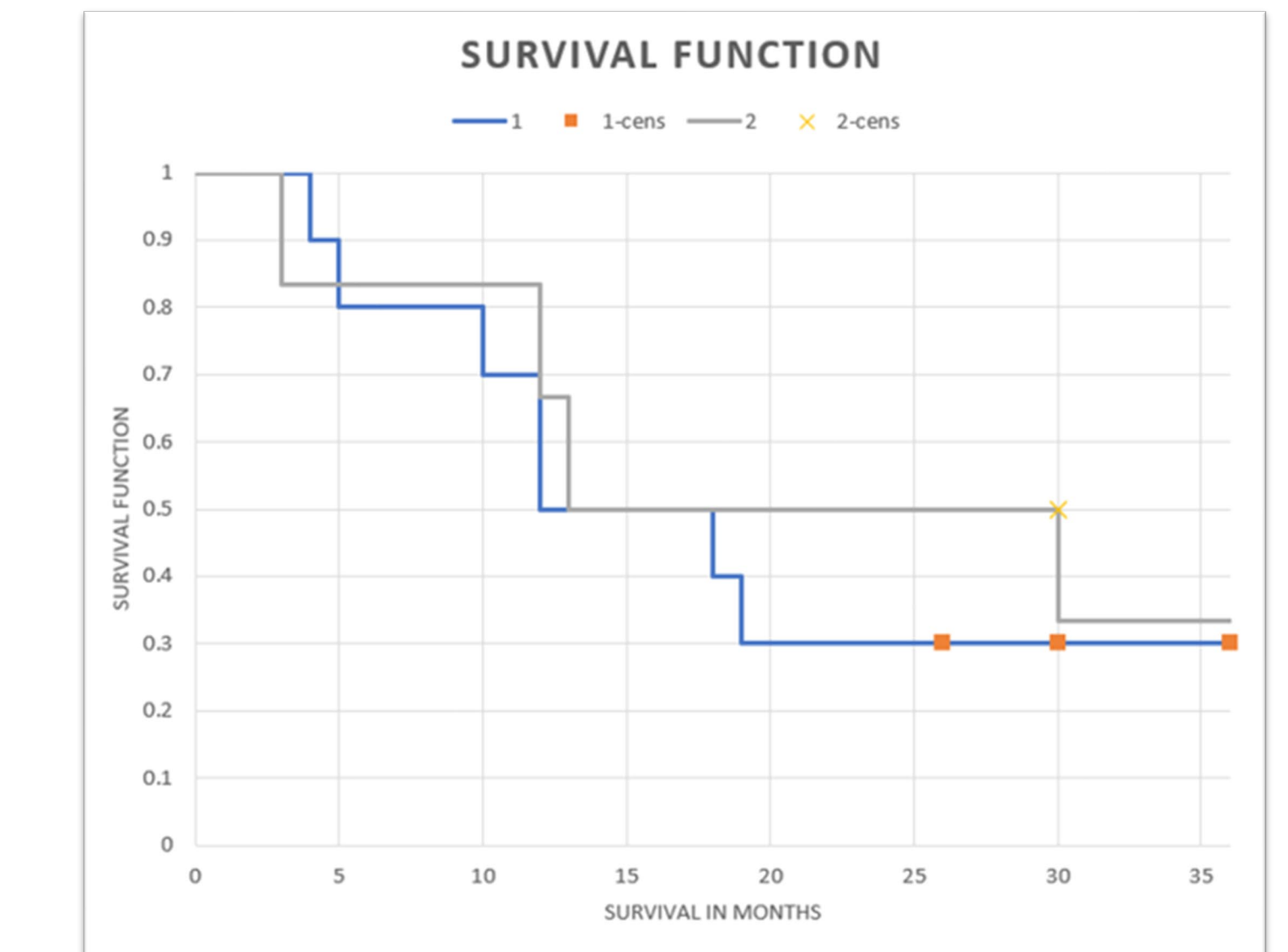
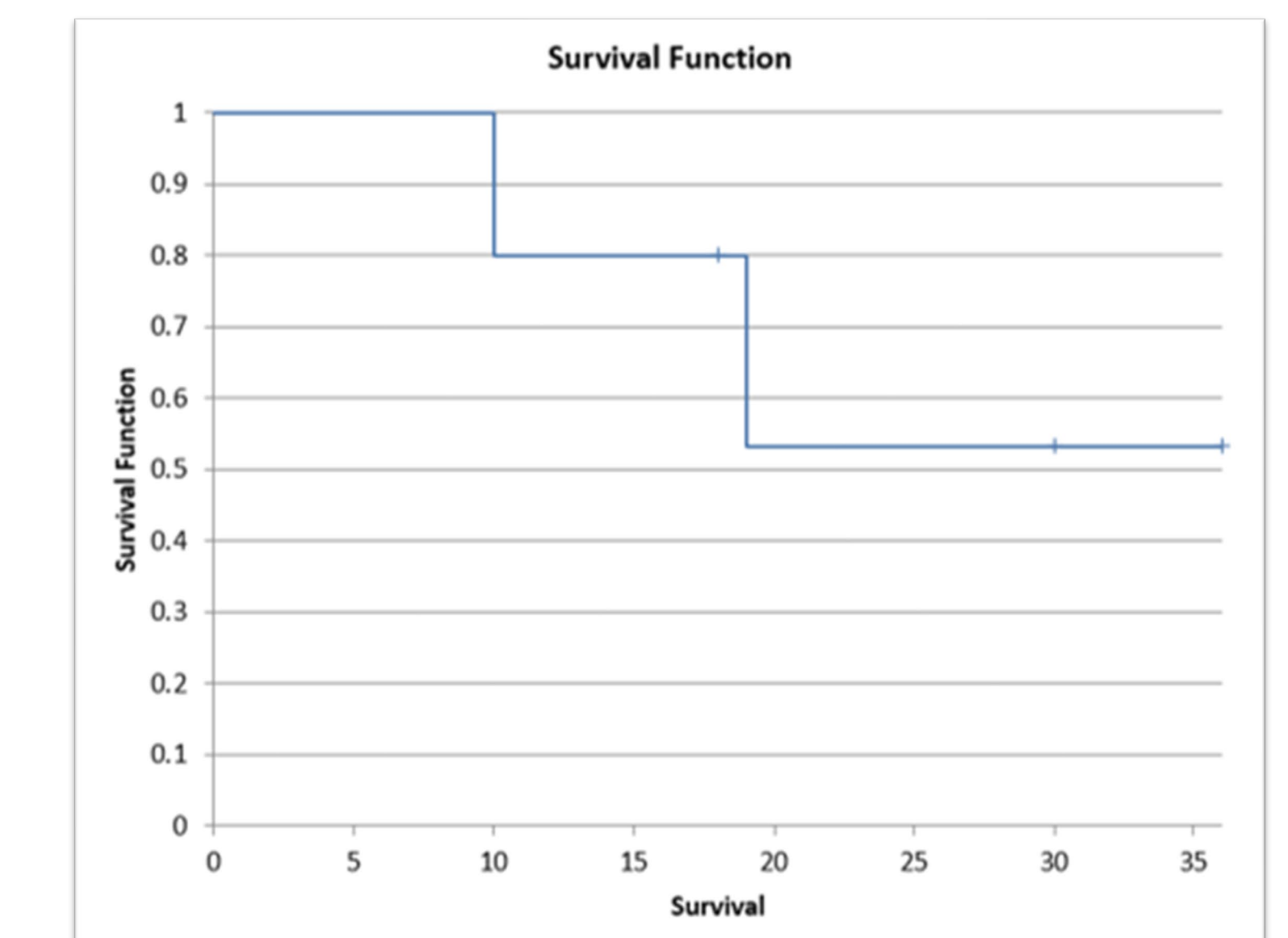


Figure 3: OS of the 5/16 (31%) IO treated patients who were tissue 22C3 PD-L1 negative



## 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

## REFERENCES

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

## ACKNOWLEDGEMENT

CIRCULOGENE performed the plasma cfPD-L1 RNA testing

## CONTACT INFORMATION

walkerp@ecu.edu