## 28 PREDICTIONS OF OUTCOMES AND BENEFIT OF IMMUNE CHECKPOINT INHIBITOR TREATMENT IN NSCLC REQUIRE INFORMATION ON BOTH TUMOR AND HOST BIOLOGY

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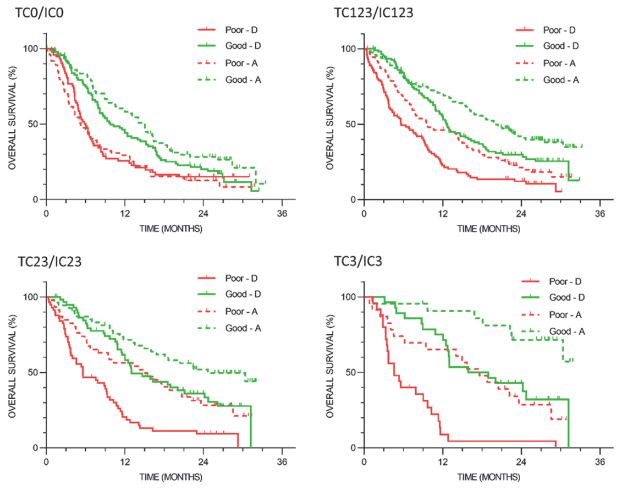
**Background** Immunotherapy has become a key element in the arsenal of treatments for advanced non-small cell lung cancer (NSCLC). The anti-PD-L1 Response Test (ART), based on mass spectrometry of pretreatment serum, captures the effect of host biology on outcomes after atezolizumab (A) therapy. It stratified outcomes on A and was predictive of benefit of A over docetaxel (D) in a blinded, retrospective study of 2nd and 3rd line NSCLC patients in the POPLAR Ph2 clinical study.[1] Our current work applies the test to the larger OAK NSCLC Ph3 clinical study[2] to investigate the interplay between tumor PD-L1 expression and ART classifications in predicting outcomes and benefit from A therapy.

**Methods** Pretreatment serum samples from 823 of the 850 patients in the OAK study (NCT02008227) were analyzed with ART blinded to all clinical data. The ART assigns a result of Good or Poor corresponding to better or worse outcomes on A. Association of test classification with overall survival (OS) within and between treatment arms was investigated using Cox proportion hazards models overall and within PD-L1 subgroups defined by SP142 assay.[3]




**Abstract 28 Figure 1** Kaplan-Meier plots of OS by test classification, Good and Poor, and treatment arm, A and D, within PD-L1 subgroups

**Abstract 28 Table 1** Hazard ratios between A and D by test classification group and PD-L1 subgroup

| PD-L1 subgroup | Poor Classification Subgroup HR (CI) | Good Classification Subgroup HR (CI) |
|---|---|---|
| TC=0 and IC=0 | 1.12 (0.79-1.59) | 0.74 (0.53-1.04) |
| TC=1/2/3 or IC=1/2/3 | 0.63 (0.46-0.85) | 0.67 (0.49-0.93) |
| TC=2/3 or IC=2/3 | 0.46 (0.30-0.73) | 0.57 (0.35-0.94) |
| TC=3 or IC=3 | 0.31 (0.16-0.62) | 0.30 (0.12-0.72) |

**Results** Test classifications were generated for 786 (96%) samples; the remaining samples failed test QC, mainly due to hemolysis. A Good classification was assigned to 359 (46%) samples and a Poor classification to 427 (54%) samples. Overall, OS was better for the Good subgroup than the Poor subgroup within both arms, arm A (hazard ratio (HR)=0.52 (95% Confidence Interval (CI): 0.41–0.66)) and arm D (HR=0.54 (CI:0.43–0.68)). The test was not predictive of benefit of A over D, but was prognostic for both A and D. Patients classified as Good had better outcomes than those classified as Poor in both treatment arms for all PD-L1 subgroups investigated (figure 1). Benefit of A vs D was found in both test classification groups for PD-L1 positive patients (table 1).

**Conclusions** Information on both tumor and host are essential to predict outcomes of immunotherapy and chemotherapy in NSCLC patients.

**Trial Registration** ClinicalTrials.gov NCT02008227

### REFERENCES

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**Ethics Approval** The OAK study (NCT02008227) was done in 194 academic medical centres and community oncology practices across 31 countries worldwide. The study was done in full accordance with the guidelines for Good Clinical Practice and the Declaration of Helsinki. All patients gave written informed consent.

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