immune and clinical responses as well as safety in patients with 1st and 2nd line unresectable MPM. **Methods** Eligible patients (experimental arm, n=20) received ONCOS-102 given intratumorally under CT or US guidance at a dose of 3 × 10 × 11 on Day 1, 4, 8, 36, 78 and 120 plus six cycles of SoC starting on Day 22. The control group (n=11) received only SoC. Imaging was done at baseline, Day 43–64 and 127–148. Patients were monitored regularly for immunological assessment including lesional biopsies (baseline and Day 36). Primary objective was safety and tolerability. Secondary objectives were immunological activation, ORR, PFS and OS as well as correlation between immunological activation and clinical outcome. **Results** There were no safety concerns nor DLTs. In 1st line patients ORR/DCR was 30%/90% in the experimental group and 33%/83% in the control group. 2nd line patients had ORR/DCR of 11%/67% in the experimental group and 60%/80% in the control group. 12-month survival rate for the 1st line pts was 64% in the experimental group and 50% in the control group. PFS and OS are still to be reported. The treatment with ONCOS-102 induced strong upregulation of multiple genes associated with immune activation in tumor lesions. Profound innate and adaptive immune activation was observed in the experimental vs control group that was associated with better clinical outcome. In addition to an increase in intratumoral cytotoxic T-cells (10/15 pts), the treatment with ONCOS-102 resulted in polarization from M2 to M1 macrophages. An upregulation of PD-L1 was reported in 9/15 pts in the experimental group vs 2/5 pts in the control arm, highlighting the potential of ONCOS-102 as an immunosensitizing agent for combinatorial therapies with checkpoint inhibitors. **Conclusions** ONCOS-102 treated patients benefited from superior immune activation compared to patients receiving SoC with preliminary signals of clinical efficacity. Upregulation of adaptive immunity and cytotoxicity related gene expression, PD-L1 level and M2 to M1 macrophage polarization indicate that ONCOS-102 can induce a favourable TME modulation thus providing a scientific rationale for combination with check point inhibition. **Trial Registration** ClinicalTrials.gov nct02879669

**Ethics Approval** This study was approved by the IRBs of all the sites in Madrid, Barcelona, Rennes and Poitiers.

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362 A PHII STUDY OF BEMCENTINIB, A FIRST-IN-CLASS SELECTIVE AXL KINASE INHIBITOR, IN COMBINATION WITH PEMBROLIZUMAB IN PTS WITH PREVIOUSLY-TREATED ADVANCED NSCLC: CLINICAL & TRANSLATIONAL ANALYSIS

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**Background** AXL is implicated in resistance to immunotherapy. Bemcentinib (BGB324), a first-in-class, oral, selective and potent AXL kinase inhibitor, enhances checkpoint inhibitor (CPI) efficacy in pre-clinical models through tumor-immune mechanisms.

**Methods** BGBC008 is a PhII single-arm, 2-stage study with bemcentinib (200 mg/d) and pembrolizumab (200 mg/q3wk) for previously-treated stage IV lung adenocarcinoma comprising 3 cohorts: chemotherapy-pretreated IO-naïve patients (Cohort-A), patients progressing on prior IO therapy (Cohort-B) or chemotherapy/pembrolizumab combination (Cohort-C). Primary endpoint was ORR according to RECISTV.11 with pre-defined criteria to proceed from the first to second stage in each cohort. Secondary endpoints included DCR, PFS, OS and safety. Exploratory endpoints include biomarker analysis and correlation with clinical endpoints, including composite (tumor and immune cell) cAXL score, PD-L1 TPS, and genome-wide mutational and transcriptome analyses.

**Results** As of July 2020, enrollment in Cohort-A and B (stage 1) is completed; a total of 66 NSCLC patients were dosed. Cohort-A (n=50) results were previously presented. All Cohort-B1 (n=16) patients received at least one prior line of therapy, the most recent including CPI; 4 patients had 1 and 12 had 2+ prior treatments. Of the Cohort-B1 patients, cAXL status was available for 13 patients: 8 cAXL-positive, 5 cAXL-negative. PD-L1 TPS was available for 13 patients: 5 TPS >50%, 5 TPS 1–49%, and 3 TPS <1%. Of patients who had previously undergone 1 line of CPI therapy (n=4), 75% were cAXL-positive and 25% were not evaluable for cAXL (median TPS of 20%). Patients who had previously undergone 2+ lines of therapy (n=12), 33% were cAXL-positive, 50% cAXL-negative, and 17% not evaluable for cAXL (median TPS of 50%). Of the treated pts, most common TEAEs (>25% of patients) were increased ALT (29%; 10% G3+), AST (29%; 5% G3+), and diarrhoea (29%; 1% G3+).

All cases of treatment-related transaminase increase were reversible and managed with concomitant administration of steroids and treatment interruption. Of the 15 radiologically-evaluable patients in Cohort-B1, 1 PR was observed; 6/7 (86%) cAXL-positive patients (1 PR, 5 SD) achieved clinical benefit while none was observed in cAXL negative patients. mPFS was 4.7mo in cAXL-positive and 1.9mo in cAXL-negative patients. Ongoing transcriptional analysis of pre-treatment biopsies revealed a distinct gene profile correlating with clinical benefit from bemcentinib + pembrolizumab combination treatment.

**Conclusions** Overall, bemcentinib in combination with pembrolizumab was well-tolerated and shows promising clinical activity in AXL-positive immunotherapy refractory disease. Updated clinical activity in AXL-positive immunotherapy refractory disease. Updated survival and translation/biomarker data will be presented.

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**Trial Registration** NCT03184571

**Ethics Approval** This study was approved by all relevant institutions, including London Bridge Research Ethics Committee (UK), REC-South East (Norway), Drug Research Ethics Committee of the University Hospital Clinic of Barcelona (Spain), MCW/FH Institutional Review Board #4, Medical College of Wisconsin (USA).

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