Table S1. Summary of Study Characteristics

| Trial Acronym/ Author (Year) | Study Design/ Trial Phase | Treatment | Line of Therapy | Biomarker | Biomarker Cut-off Definition | Biomarker Assay Used | Outcomes Reported |
| --- | --- | --- | --- | --- | --- | --- | --- |
| OS | PFS | Response Rates |
| **NSCLC** |
| BIRCH [S-[1-3](#_ENREF_1)] | Phase 2, single arm  | ATEZO | 1, 2, or ≥ 3 | PD-L1 | ≥ 50%;1%-49% | SP142 IHC assay Ventana Medical Systems, Tucson, Arizona) | √ | √ | √ |
| *KRAS* | Mutant; wild type | √ | √ | √ |
| EGFR | Mutant; wild type |
| CheckMate 012 [S-[4](#_ENREF_4), [5](#_ENREF_5)] | Phase 1 study | NIVO | 1 | PD-L1 | ≥ 1%; < 1 %  | NR | √ | √ | √ |
| EGFR | Mutant; wild type | NR | √ | √ | √ |
| *KRAS* | Mutant; wild type | NR | √ | √ | √ |
| CheckMate 017 [S-[6](#_ENREF_6)] | Phase 3 RCT | NIVO or DTX | 2 | PD-L1 | < 1%; ≥ 1%; < 5%; ≥ 5%; < 10%; ≥ 10% | IHC assay (Dako North America, Carpinteria, California) antihuman PD-L1 mAb (clone 28-8, Epitomics, Burlingame. California)  | √ | √ | √ |
| CheckMate 017/057 [S-[7](#_ENREF_7), [8](#_ENREF_8)] | Follow-up of two phase 3 trials  | NIVO or DTX | ≥ 1 | Cytoscore  | High; low | Multivariate analyses of baseline serum cytokines  | √ |  |  |
| PD-L1 | < 1%; ≥ 1%; ≥ 50% | NR | √ |  |  |
| CheckMate 026 [S-[9](#_ENREF_9), [10](#_ENREF_10)] | Phase 3 RCT | NIVO or platinum-based chemotherapy | 1 | PD-L1 | All: > 1%; ≥ 5%; ≥ 50% | Anti–PD-L1 antibody (28-8 antibody) | √ | √ | √ |
| TMB | High; low or medium | NR | √ | √ | √ |
| TMB and PD-L1 | High and PD-L1 ≥ 50%; high and PD-L1 1%-49%; low or medium and PD-L1 ≥ 50%; high and PD-L1 1%-49% |  |  | √ |
| CheckMate 057 [S-[11-13](#_ENREF_11)] | Phase 3 RCT | NIVO or DTX | ≥ 2 | PD-L1 | < 1%; ≥ 1%; < 5%≥ 5%; < 10%; ≥ 10% | IHC assay (Dako North America, Carpinteria, California) antihuman PD-L1 mAb (clone 28–8) | √ | √ | √ |
| EGFR | Positive; negative | NR | √ | √ |  |
| ALK  | Translocation not detected | NR | √ | √ |  |
| *KRAS* | Positive | NR | √ | √ |  |
| CheckMate 063 [S-[14](#_ENREF_14)] | Phase 2 single arm | NIVO  | ≥ 3 | PD-L1 | < 1%; ≥ 1%; < 5%≥ 5%;< 10%; 10% | IHC assay (Dako North America, Carpinteria, California) | √ | √ | √ |
| ALK translocation status | Negative; positive | NR | √ | √ |  |
| CheckMate 227 [S-[15](#_ENREF_15)] | Multipart phase 3 trial | NIVO + IPI, NIVO + platinum-based chemotherapy, NIVO monotherapy, or platinum-based chemotherapy alone | 1 | TMBa | ≥ 10 mutations per mb< 10 mutations per mb | Foundation One CDx assay (Foundation Medicine, Cambridge, Massachusetts) |  | √ | √ |
| TMBa + PD-L1 | ≥ 10 mutations per mb + ≥ 1%≥ 10 mutations per mb + < 1%≥ 13 mutations per mb + ≥ 1% | FoundationOne CDx assay (Foundation Medicine, Cambridge, Massachusetts) |  | √ |  |
| CP1108 [S-[16-22](#_ENREF_16)] | A phase 1/2 escalation and dose-expansion study | DURVA  | 1, 2, and ≥ 3 | PD-L1 and IFN-γ mRNA | None; all PD-L1 ≥ 25%; PD-L1 IHC < 25%; all IFN-γ+IFN-γ+ and PD-L1 ≥ 25%; IFN-γ+ and PD-L1 < 25%; all IFN-γ–IFN-γ– and PD-L1 ≥ 25%; IFN-γ– and PD-L1 < 25% | Analytically validated Ventana SP263 assay optimized for use on the automated BenchMark ULTRA platform (Ventana Medical Systems, Oro Valley, Arizona) and using Fluidigm Biomark for mRNA | √ |  | √ |
| PD-L1 | ≥ 25%; < 25% | √ | √ | √ |
| JAVELIN Solid Tumor [S-[23-32](#_ENREF_23)] | Dose-expansion cohort of an OL, phase 1 study | AVE | ≥ 2 | PD-L1 | < 1%; ≥ 1%; < 5%≥ 5%; < 10%; ≥ 10% | IHC assay (Dako North America, Carpinteria, California) anti–PD-L1 mAb clone 73–10 (Merck & Co. Inc., Kenilworth, New Jersey)  | √ | √ | √ |
| EGFR | Wild type; mutant | NR | √ | √ |  |
| *KRAS* | Wild type; mutant | NR | √ | √ |  |
| KEYNOTE-001 [S-[33-40](#_ENREF_33)] | OL, phase 1, RCT | PEM | ≥ 1 | PD-L1 | ≥ 50%; 1%-49%; < 1%; positive; negative | IHC assay (early version of the PD-L1 22C3 IHC pharmDx assay; Dako North America, Carpinteria, California) | √ | √ | √ |
| *TP53* | *TP53* mutation | NR |  | √ |  |
| *KRAS* | Wild type; mutant |  | √ |  |
| EGFR | Wild type; mutant | √ |  |  |
| Baseline tumor size | Below median (10.2 cm); above median (10.2 cm) | NR |  |  | √ |
| *BRAF* | Wild type; mutant | NR | √ |  | √ |
| KEYNOTE-010 [S-[41-44](#_ENREF_41)] | Randomized, OL, phase 2/3 study | PEM or DTX | ≥ 1 | PD-L1 | ≥ 50%; 1%-49%; 1%‑24%; 25%-49%; 50%-74%; ≥ 75%; ≥ 1% | IHC assay with the murine 22C3 antihuman PD-L1 antibody | √ | √ | √ |
| EGFR | Mutant; wild type | NR | √ | √ |  |
| OAK [S-[45-49](#_ENREF_45)] | Randomized, OL, phase 3 study | ATEZO or DTX | > 1 | PD-L1 | ≥ 10%; ≥ 5%; ≥ 1%; < 1% | VENTANA SP142 PD-L1 IHC assay (Ventana Medical Systems, Tucson, AZ, USA) | √ | √ | √ |
| *KRAS* | Mutant; wild type | NR | √ |  |  |
| EGFR | Mutant; wild type | NR | √ |  |  |
| ≥ 2 | TMB | ≥ 10; ≥ 16; ≥ 20 | bTMB assay | √ |  |  |
| POPLAR [S-[49-54](#_ENREF_49)] | OL, phase 2 RCT | ATEZO or DTX | ≥ 2 | PD-L1 | ≥ 10%; ≥ 5%; ≥ 1%; < 1%; < median; ≥ median  | VENTANA SP142 PD-L1 IHC assay (Ventana Medical Systems, Tucson, AZ, USA) | √ | √ | √ |
| PD-L2 | < Median; ≥ median | NR | √ |  |  |
| B7.1  | < Median; ≥ median  | NR | √ |  |  |
| T effector- IFN-γ | < Median; ≥ median  | NR | √ |  |  |
| TMB | ≥ 10; ≥ 16; ≥ 20 | NR | √ | √ |  |
| NCT00730639 Topalian et al. (2012) [S-[55](#_ENREF_55), [56](#_ENREF_56)] | Phase 1 dose-escalation, cohort-expansion study  | NIVO | ≥ 2 | PD-L1 | ≥ 5%; < 5% | Murine antihuman PD-L1 monoclonal antibody, clone 5H1  | √ | √ | √ |
| EGFR | Mutant; wild type | NR |  |  | √ |
| *KRAS* | Mutant; wild type | NR |  |  | √ |
| NCT01375842 [S-[57](#_ENREF_57), [58](#_ENREF_58)] | Phase 1, single arm, dose escalation with expansion cohorts | ATEZO | NR | PD-L1 | < 1%; 1% to < 5%; 5% to < 10%; 1%-10%; ≥ 10%; ≥ 1% | SP142 assay (Ventana Medical Systems, Tucson, AZ, USA)  |  | √ | √ |
| PD-L2 | Positive; positive and PD-L1 positive | SP142 assay (Ventana Medical Systems, Tucson, AZ, USA) |  |  | √ |
| ID01 | Positive | NR |  |  | √ |
| *LAG3* | Positive | NR |  |  | √ |
| TIM3 | Positive | NR |  |  | √ |
| CTLA-4 | Positive | NR |  |  | √ |
| B7-H3  | Positive | NR |  |  | √ |
| B7-H4 | Positive | NR |  |  | √ |
| ID01 | Positive and PD-L1+  | NR |  |  | √ |
| *LAG3* | Positive and PD-L1+ | NR |  |  | √ |
| TIM3 | Positive and PD-L1+ | NR |  |  | √ |
| CTLA-4 | Positive and PD-L1+ | NR |  |  | √ |
| B7-H3 | Positive and PD-L1+ | NR |  |  | √ |
| B7-H4 | Positive and PD-L1+ | NR |  |  | √ |
| Bagley et al. (2017) [S-[59](#_ENREF_59)] | Retrospective cohort study | NIVO | NR | Neutrophil-to-lymphocyte ratio | ≥ 5; < 5 | NR | √ | √ |  |
| De Castro et al. (2017) [S-[60](#_ENREF_60)] | Retrospective evaluation | Nonspecified anti–PD-1 and anti–PD-L1 | NR | LDH | Baseline ≥ 400; baseline < 400; < baseline at ≥ 3 evaluations; > baseline at ≥ 3 evaluations | NR | √ |  | √ |
| Gettinger (2015a) [S-[61](#_ENREF_61)] | Phase 1 study | NIVO | 1 | PD-L1 | ≥ 5%; < 5% | NR |  |  | √ |
| Kaderbhai et al. (2017) [S-[62](#_ENREF_62)] | Retrospective cohort study | NIVO | 2 and 3 | PD-L1 | ≥ 1%; < 1% | IHC using SP142 mAb | √ | √ | √ |
| EGFR | Mutant; wild type |  |  | √ |
| *KRAS* | Mutant; wild type |  |  | √ |
| Nomizo et al. (2017) [S-[63](#_ENREF_63)] | Retrospective medical record review | NIVO  | ≥ 2 | PD-L1 SNPs | Different intron/ missense mutation | TaqMan® genotyping assay (Applied Biosystems, Foster City, California) analyzed with Applied Biosystems 7300 Real-Time PCR System  |  | √ | √ |
| Pabla et al. (2017) [S-[64](#_ENREF_64)] | NR | ≥ 1 nonspecified checkpoint inhibitors | NR | PD-L1 | > 50% + inflamed; ≤ 50% + inflamed; ≤ 50% | PD-L1 (22C3) IHC and custom NGS cancer immune gene expression assay |  |  | √ |
| Roach et al. (2016) [S-[65](#_ENREF_65)] | Retrospective of phase 1 trial | PEM | NR | PD-L1 | ≥ 50% | PD-L1 IHC 22C3 pharmDx assay |  |  | √ |
| Sabari et al. (2017) [S-[66](#_ENREF_66)] | NR | NIVO, PEM, ATEZO, DURVA, IPI + NIVO | NR | PD-L1 | ≥ 50%; 0% | IHC |  |  | √ |
| Sorensen et al. (2016) [S-[67](#_ENREF_67)] | Retrospective study | PEM + platinum-based chemotherapy  | 1 | PD-L1 | ≥ 50%; 1%-49%; < 1%; ≥ 1% | Prototype IHC assay with anti–PD-L1 22C3 antibody (Merck & Co., Inc., Kenilworth, New Jersey) | √ |  |  |
| Yaghmour et al. (2016) [S-[68](#_ENREF_68)] | Retrospective database search | NIVO, PEM, or IPI  | ≥ 1 | Tumor mutational load | Top quintile; other quintiles combined | NGS cancer immune gene expression assay | √ |  |  |
| B‑F1RST [S-[69](#_ENREF_69)] | Phase 2 single-arm trial | ATEZO | 1 | Blood-based TMB | ≥ 12; < 12; ≥ 14; < 14; ≥ 16; < 16; ≥ 20; < 20 | NR |  | √ | √ |
| **SCLC** |
| CheckMate 032 [S-[70](#_ENREF_70), [71](#_ENREF_71)] | Multicenter, phase 1/2  | NIVO and/or IPI | ≥ 2 | PD-L1 | < 1%; ≥ 1% | IHC assay (Dako North America, Carpinteria, California) antihuman PD-L1 mAb (clone 28–8) |  |  | √ |
| **Melanoma** |
| CA184004 [S-[72](#_ENREF_72)] | Phase 2 trial | IPI  | NR | Gene expression profiles | NR | NR | √ |  |  |
| CA209-004 [S-[73](#_ENREF_73)] | Phase 1 study | NIVO, IPI | Mixed | PD-L1 | ≥ 5%; < 5% | IHC assay (Dako North America, Carpinteria, California) antihuman PD-L1 mAb (clone 28–8) |  |  | √ |
| ALC | ALC < 1.0 × 103 cells/L at weeks 5-7)ALC ≥ 1.0 × 103 cells/L at weeks 5-7) | NR |  |  | √ |
| CheckMate 037 [S-[74](#_ENREF_74)] | Phase 3 RCT | NIVO or chemotherapy | ≥ 2 | *BRAF* | Mutant; wild type | NR |  |  | √ |
| PD-L1 | Positive; negative | Automated Bristol-Myers Squibb/Dako IHC assay (Bristol-Myers Squibb, New York City, New York; Dako North America, Carpinteria, California) |  |  | √ |
| CheckMate 066 [S-[75](#_ENREF_75)] | Phase 3 RCT | NIVO or dacarbazine | 1 | PD-L1 | ≥ 5%; < 5% | IHC assay (Bristol-Myers Squibb, New York City, New York; Dako North America, Carpinteria, California) | √ |  | √ |
| CheckMate 066/067/069 [S-[76](#_ENREF_76)] | Phase 2 and phase 3 trials | NIVO +IPI or NIVO | NR | PD-L1 | ≥ 5%; < 5% | Dako IHC (Dako North America, Carpinteria, California) |  | √ | √ |
| CheckMate 067 [S-[77-79](#_ENREF_77)] | Phase 3 RCT | NIVO or IPI  | 1 | PD-L1 | ≥ 5%; < 5% | IHC assay (Dako North America, Carpinteria, California) antihuman PD-L1 mAb (clone 28–8) |  | √ | √ |
| *BRAF* | Wild type; mutant | NR |  | √ |  |
| CheckMate 069 [S-[80](#_ENREF_80), [81](#_ENREF_81)] | Phase 1 dose-escalation study | NIVO and IPI or IPI and PBO | 1 | PD-L1 | ≥ 5%; < 5% | IHC assay (Bristol-Myers Squibb, New York City, New York; Dako North America, Carpinteria, California)  |  |  | √ |
| *BRAF* | Wild type; mutant | NR |  | √ | √ |
| KEYNOTE-001 [S-[33-40](#_ENREF_33), [82](#_ENREF_82)] | OL, phase 1, RCT | PEM | 2 | PD-L1 | ≥ 1%; < 1% | IHC assay (PD-L1 IHC 22C3 pharmDx; Dako North America, Carpinteria, California) | √ | √ | √ |
| KEYNOTE-002 [S-[83](#_ENREF_83)] | Randomized, phase 2 trial | PEM or chemotherapy  | ≥ 1 | *BRAF* | Mutant; wild type | NR |  | √ |  |
| KEYNOTE-006 [S-[84-86](#_ENREF_84)] | Randomized, OL, phase 3 trial | PEM or IPI | 1 and 2 | PD-L1 | Positive; negative | IHC analysis, 22C3 antibody (Merck & Co. Inc., Kenilworth, New Jersey) | √ | √ |  |
| *BRAF* | Wild type; mutant | NR | √ | √ |  |
| MDX010-020 [S-[87](#_ENREF_87)] | Randomized study  | IPI and tremelimumab | ≥ 1 | CTLA-4 | *BRAF* (V600) or *NRAS* mutation; *BRAF*/*NRAS* wild type; *BRAF* and *NRAS* mutated | NR | √ |  |  |
| NCT00257205 Ribas et al. (2013) [S-[88](#_ENREF_88)] | Phase 3 RCT  | Tremelimumab or SOC | 1 | LDH | ≤ ULN; 1-2 × ULN; > 2 × ULN | NR | √ |  |  |
| HLA | A2; Other | NR | √ |  |  |
| NCT00324155 Robert et al. (2011) [S-[89](#_ENREF_89)] | Randomized, DB, phase 3 study | IPI + dacarbazine or dacarbazine + PBO  | 1 | LDH | > ULN; < ULN; > 2 × ULN; < 2 × ULN | NR | √ |  |  |
| NCT01176461 Weber et al. (2013) [S-[90](#_ENREF_90)] | Phase 1 study | NIVO | ≥ 2 | PD-L1 | ≥ 5%; < 5%; ≥ 1%; < 1% | IHC assay (Dako North America, Carpinteria, California) antihuman PD-L1 mAb (clone 28–8) |  |  | √ |
| Algazi et al. (2016) [S-[91](#_ENREF_91)] | Retrospective medical record review | PEM, NIVO, ATEZO | Multiple | LDH | Normal; elevated | NR | √ | √ |  |
| Arenberger et al. (2017) [S-[92](#_ENREF_92)] | Prospective single-arm study | IPI | Multiple | MAGE-3 | > 1 and ≤ 10; > 10 and ≤ 100; > 100 | Quantitative real-time RT-PCR: MIA, Melan-A/MART-1, MAGE-3, and gp100 (glycoprotein) | √ |  |  |
| Melan-A, gp100, MAGE-3, and melanoma inhibitory antigen | Increase in marker levels at visit 3 compared to visit 1Significant mean reduction by more than 30% |  |  | √ |
| Chakravarti et al. (2017) [S-[93](#_ENREF_93)] | Prospective single-arm study | IPI  | NR | Baseline ALC/U | NR | NR | √ | √ |  |
| Baseline LDH/100U | NR | NR | √ | √ |  |
| Tumor CTLA-4 percentage | < 20% (negative);≥ 20% (positive) | Antibody against CTLA-4, PD-1, and PD-L1 (Abcam, Cambridge, Massachusetts), FASL (Santa Cruz Biotechnologies, Santa Cruz, California), p-S6 and p-AKT (Cell Signaling, Danvers, Massachusetts), and BRAF-V600E (Ventana Medical Systems, Tucson, Arizona) | √ | √ |  |
| CTLA-4 intensity | 0; > 0 | √ |  |  |
| Tumor p-AKT intensity | ≤ 1 (negative); > 1 (positive) | √ |  |  |
| Tumor p-AKT/FAS-L intensity | –/–; +/–; +/+ | √ | √ |  |
| Tumor p-AKT/CTLA-4 percentage | –/–; –/+; +/–; +/+ | √ | √ |  |
| Tumor p-AKT/p-S6 intensity | –/– |  | √ |  |
| Dick et al. (2016) [S-[94](#_ENREF_94)] | Retrospective database analysis  | IPI | NR | LDH | Change in value after two cyclesNormal compared to elevated | NR | √ | √ |  |
| Diem et al. (2016) [S-[95](#_ENREF_95)] | Retrospective analysis | PEM or NIVO | NR | LDH | Normal; > ULN; > 10% CFB; ≤ 10% CFB | Serum LDH | √ |  | √ |
| Felix et al. (2016) [S-[96](#_ENREF_96)] | Prospective single-arm study | IPI  | NR | LDH | < 500 U/L; ≥ 500 U/L | NR | √ |  |  |
| S100B | ≤ 0.15 µg/L; > 0.15 µg/L | S100 ELISA kit (DiaSorin, Stillwater, Minnesota) | √ |  |  |
| Anti-MICA | < 2; ≥ 2 | LABScreen assay | √ |  |  |
| Soluble MICA | ≤ 45 pg/mL; > 45 pg/mL | Human soluble MICA ELISA kit (Bamomab, Grafelfing, Germany) | √ |  |  |
| MIA | < 7.5 µg/L; ≥ 7.5 µg/L | MIA ELISA kit (Roche, Mannheim, Germany) | √ |  |  |
| Heppt et al. (2017) [S-[97](#_ENREF_97)] | Retrospective exploratory analysis | NIVO or IPI | NR | LDH | Normal; > ULN | NR | √ |  |  |
| CRP | Normal; > ULN | NR | √ |  |  |
| RLC | < 17.5%; ≥ 17.5% | NR | √ |  |  |
| REC | < 1.5%; ≥ 1.5% | NR | √ |  |  |
| Johnson et al. (2015) [S-[98](#_ENREF_98)] | Retrospective medical study | IPI | NR | PD-L1 | *NRAS* mutant; *BRAF* mutant; wild type | IHC assay (Dako North America, Carpinteria, California) antihuman PD-L1 mAb (clone 28-8) | √ | √ | √ |
| Johnson et al. (2016) [S-[99](#_ENREF_99)] | Retrospective medical study | NIVO, PEM, or ATEZO | ≥ 1 | TML | High (> 23.1 mutations per mb)Intermediate (3.3-23.1 mutations per mb)Low (< 3.3 mutations per mb) | Amendments-certified, hybrid capture-based NGS platform (FoundationOne, Foundation Medicine, Cambridge, Massachusetts) | √ | √ | √ |
| Ku et al. (2010) [S-[100](#_ENREF_100)] | Prospective, single-arm, compassionate use study | IPI  | ≥ 2 | ALC | ≥ 1000/µL; < 1000/µL | NR | √ |  |  |
| Larkin et al. (2015b) [S-[101](#_ENREF_101)] | Pooled analysis of four clinical trials  | NIVO | Multiple | *BRAF* | Wild type; Mutant | NR |  |  | √ |
| LDH | ≤ ULN and *BRAF* wild type; > ULN and *BRAF* wild type; ≤ ULN and *BRAF* mutation; > ULN and *BRAF* mutation | NR |  |  | √ |
| PD-L1 | ≥ 5% and *BRAF* mutation; < 5% and *BRAF* mutation; ≥ 5% and *BRAF* wild type; < 5% and *BRAF* wild type | NR |  |  | √ |
| Martens et al. (2016) [S-[102](#_ENREF_102)] | Cohort study  | IPI | Multiple | LDH | ≤ 1.2; > 1.2; > 2.3 | NR | √ |  |  |
| RLC | < 10.5%; ≥ 10.5% | NR | √ |  |  |
| AMC | < 650/µL; ≥ 650/µL | NR | √ |  |  |
| AEC | < 50/µL; ≥ 50/µL | NR | √ |  |  |
| REC | < 1.5%; > 1.5% | NR | √ |  |  |
| CD4 + *CD25* + *FoxP3* + regulatory T cell  | < 1.5%; ≥ 1.5% | NR | √ |  |  |
| *CD14*+ monocytes | < 28%; ≥ 28% | NR | √ |  |  |
| Lin-*CD14*+ HLA-DR/low MDSCs | < 5.1%; ≥ 5.1%; ≥ 9.5% | NR | √ |  |  |
| Morrison et al. (2017) [S-[103](#_ENREF_103)] | NR | One or more nonspecified checkpoint inhibitors | ≥ 1 | PD-L1 | PD-L1 positive + inflamed phenotype;PD-L1 negative + inflamed phenotype;PD-L1 negative | PD-L1 IHC and custom NGS immune gene expression assay |  |  | √ |
| Roh et al. (2017) [S-[104](#_ENREF_104)] | Longitudinal cohort study | IPI | NR | Mutational load/burden of copy number loss | High mutation + low copy loss;High mutation + high copy loss;Low mutation + low copy loss;Low mutation + high copy loss | NR |  |  | √ |
| Roszik et al. (2016) [S-[105](#_ENREF_105)] | Retrospective samples | IPI or PEM | NR | Predicted TML  | ≤ 100; > 100 | NR | √ | √ |  |
| Sade-Feldman et al. (2016) [S-[106](#_ENREF_106)] | Controlled clinical trial | IPI | ≥ 2 | MDSC | MDSCs > 55.5%; MDSCs < 55.5% | FACSCalibur using Cell Quest software (BD Biosciences, San Jose, California) | √ |  |  |
| LDH | LDH > 480 U/I; LDH < 480 U/I | √ |  |  |
| MDSC/LDH | High; MDSCs/LDH; low MDSCs/LDH | √ |  |  |
| Saenger et al. (2014) [S-[107](#_ENREF_107)] | Retrospective samples of phase 2 and phase 3 trials | Tremelimumab | ≥ 1 | Risk score | Low risk; intermediate risk; high risk | NR | √ |  |  |
| Sim and Elsheikh (2016) [S-[108](#_ENREF_108)] | Retrospective cohort study | NR | NR | PD-L1 | Tumor-infiltrating lymphocytes; melanoma tumor cells | NR |  | √ |  |
| Wilgenhof et al. (2013) [S-[109](#_ENREF_109)] | Prospective observational study | IPI | ≥ 2 | CRP | Baseline CRP ≤ 5 × ULN; Baseline CRP > 5 × ULN | NR | √ |  |  |
| ALC | ALC ≥ 800/mm3;ALC < 800/mm3; ALC at week 6 (2 doses);  800/mm3;ALC at week 6 (2 doses); < 800/mm3;ratio ALC ; 1Ratio ALC ≤ 1 | NR | √ |  |  |
| Wistuba-Hamprecht et al. (2017) [S-[110](#_ENREF_110)] | Retrospective medical samples | IPI | NR | CD4 T cells | TCM ≤ 26.5%; TCM > 26.5%; TEM1 ≤ 17.5%; TEM1 > 17.5%; TEM3 ≤ 3.9%; TEM3 > 3.9%; TEM4 ≤ 0.2%; TEM4 > 0.2% | NR | √ |  |  |
| CD8 T cells | Naive ≤ 23.3%; naive > 23.3%; TCM ≤ 2.5%; TCM > 2.5%; TEM1 ≤ 13.0%; TEM1 > 13.0%; TEM3 ≤ 1.5%; TEM3 > 1.5%; TEM4 ≤ 1.9%; TEM4 > 1.9%; TEMRA ≤ 23.8%; TEMRA > 23.8% | NR | √ |  | √ |
| Wu et al. (2017) [S-[111](#_ENREF_111)] | Retrospective medical samples | Various | ≥ 1 | ANGPT2 | Pretreatment:> 3175 pg/mL; ≤ 3175 pg/mL; fold change:≥ 1.25 pg/mL; < 1.25 pg/mL | ANGPT2 plasma/serum samples measured using Magnetic Luminex Screening Assay kits (R&D Systems, Minneapolis, Minnesota)  | √ |  | √ |
| Yaghmour et al. (2016) [S-[68](#_ENREF_68)] | Retrospective database search | NIVO, PEM, or IPI | ≥ 1 | TML | Top quintile; other quintiles combined | NGS reports generated from tissue biopsy specimens  | √ |  |  |
| Yuan et al. (2014) [S-[112](#_ENREF_112)] | Retrospective medical samples | IPI | NR | VEGF | VEGF < 43 pg/mL; VEGF ≥ 43 pg/mL | MSD SECTOR Imager 2400 instrument (Meso Scale Discovery, Inc., Rockville, Maryland) | √ |  | √ |
| Zhou et al. (2017) [S-[113](#_ENREF_113)] | Retrospective medical samples | IPI + BEV or IPI or IPI + sargramostim or PEM | NR | Soluble PD-L1 | Soluble PD-L1 all < 1.4 ng/mL;Soluble PD-L1 all ≥ 1.4 ng/mL;Soluble PD-L1 < 0.5 ng/mL;Soluble PD-L1 ≥ 0.5 ng/mL | NR |  |  | √ |
| Chasseuil et al. (2018) [S-[114](#_ENREF_114)] | Pilot monocentric retrospective study | NIVO | ≥ 1 | Leukocyte count | Univariate analysis;multivariate analyses | NR | √ | √ | √ |
| Lymphocyte count |
| Leukocyte/ lymphocyte ratio |
| Neutrophil count |
| Neutrophil/ lymphocyte ratio |
| Monocyte count |
| Eosinophil count |
| Lactate dehydro-genase |
| C-reactive protein |
| Gaudy-Marqueste et al. (2017) [S-[115](#_ENREF_115)] | Retrospective cohort study | No targeted or immune therapy*BRAF* ± MEK inhibitor alone*BRAF* ± MEK inhibitor and immuno-therapyImmuno-therapy aloneNo immuno-therapyAnti–PD-1 aloneIPI aloneIPI + anti–PD-1 | ≥ 1 | *BRAF* | Mutation; wild type | NR | √ |  |  |
| **Merkel cell carcinoma** |
| JAVELIN Merkel 200 [S-[116](#_ENREF_116), [117](#_ENREF_117)] | Prospective, single-group, OL, phase 2 trial | AVE | ≥ 2 | PD-L1 | Positive; negative | Proprietary research-use-only assay (Dako North America, Carpinteria, California) based on anti–PD-L1 mAb (clone 73-10; Merck KGaA, Darmstadt, Germany) |  |  | √ |
| MCPyV | Positive; negative; not evaluable | mAb specific for Merkel cell polyomavirus large T antigen (Clone *CM2B4*; Santa Cruz Biotechnology, Dallas, Texas) |  |  | √ |
| PD-L1 and MCPyV | Positive/positive;Positive/negative;Negative/positive;Negative/negative |  |  | √ |
| **Renal cell carcinoma** |
| CheckMate 025 [S-[118](#_ENREF_118)] | Phase 3 RCT | NIVO or platinum-based chemotherapy | ≥ 2 | PD-L1 | ≥ 5%; < 5% | IHC assay (Dako North America, Carpinteria, California) antihuman PD-L1 mAb (clone 28–8) | √ |  |  |
| MDX-1106 [S-[87](#_ENREF_87)] | Blinded, randomized, phase 2 trial | NIVO | ≥ 1 | PD-L1 | < 5%; ≥ 5% | IHC assay (Dako North America, Carpinteria, California) antihuman PD-L1 mAb (clone 28–8) | √ | √ | √ |
| IMMotion-150 [S-[119](#_ENREF_119), [120](#_ENREF_120)] | Phase 2 RCT | ATEZO + BEV, ATEZO, or sunitinib | 1 | PD-L1 | Positive | IC SP142 IHC assay |  | √ | √ |
| NCT01375842 McDermott et al. (2016) [S-[121](#_ENREF_121)] | Phase 1, single arm, dose escalation | ATEZO | NR | PD-L1 | ≥ 1%; < 1% | SP142 assay | √ | √ | √ |
| CheckMate 214 [S-[122](#_ENREF_122)] | Phase 3 | NIVO + IPI or sunitinib | 1 | PD-L1 | < 1%; ≥ 1% | NR | √ | √ | √ |
| **Gastric or gastroesophageal cancer** |
| ATTRACTION-02 [S-[123](#_ENREF_123)] | Phase 3 RCT | NIVO or PBO | ≥ 3 | PD-L1 | ≥ 1%; < 1% | 28-8 pharmDx assay | √ |  |  |
| KEYNOTE-059 [S-[124](#_ENREF_124)] | Global, multicohort, phase 2 study | PEM | 3 and 4 | PD-L1 | Positive; negative | IHC (22C3 antibody) |  |  | √ |
| **Colorectal cancer** |
| CheckMate 142 [S-[125](#_ENREF_125), [126](#_ENREF_126)] | Phase 2 nonrandomized study | NIVO + IPI  | ≥ 2 | PD-L1 | ≥ 1%; < 1% | Dako 28-8 pharmDx assay (Dako North America, Carpinteria, California) |  |  | √ |
| *BRAF* | Mutant | NR |  |  | √ |
| *KRAS* | Mutant |  |  | √ |
| *BRAF*/*KRAS* | Wild type |  |  | √ |
| KEYNOTE-164 [S-[127](#_ENREF_127), [128](#_ENREF_128)] | Global, multicenter, multicohort, phase 2 study | PEM | ≥ 3 | MSI-H | Positive tumors | IHC and/or PCR | √ | √ | √ |
| KEYNOTE-158 [S-[127](#_ENREF_127), [128](#_ENREF_128)] | Global, multicenter, multicohort, phase 2 study | PEM | ≥ 2 | MSI-H | Positive tumors | IHC and/or PCR | √ | √ | √ |
| **Urothelial cancer** |
| CheckMate 032 [S-[129](#_ENREF_129), [130](#_ENREF_130)] | Phase 1/2 | NIVO | ≥ 2 | PD-L1 | ≥ 1%; < 1% | IHC assay (Dako North America, Carpinteria, California) antihuman PD-L1 mAb (clone 28–8) |  | √ | √ |
| CheckMate 275 [S-[131](#_ENREF_131), [132](#_ENREF_132)] | Single-arm, phase 2 study | NIVO | ≥ 2 | PD-L1 | < 1%; ≥ 1%; < 5%; ≥ 5% | Dako PD-L1 IHC 28-8 pharmDx kit (Dako North America, Carpinteria, California) | √ |  | √ |
| CP1108 [S-[133-136](#_ENREF_133)] | Phase 1/2 dose-escalation and dose‑expansion study | DURVA  | Mixed | PD-L1 | ≥ 25%; < 25%; Low/negative | Ventana SP263 assay optimized for use on automated BenchMark ULTRA platform (Ventana Medical Systems, Tucson, Arizona) |  |  | √ |
| IFNGS | Positive: top tertile of IFNGS (*LAG3*, PD-L1, *CXCL9*, and IFN‑γ mRNAs)Negative: not top tertile of IFNGS (*LAG3*, PD-L1, *CXCL9*, and IFN-γ mRNAs) | NR | √ | √ | √ |
| IMvigor-210 [S-[137-139](#_ENREF_137)] | Single-arm phase 2 study | ATEZO 1200 mg | 1≥ 2 | PD-L1 | IC 2/3 (≥ 5%); IC 1/2/3; IC 1 (≥ 1%, < 5%); IC 0 (< 1%) | VENTANA SP142 IHC assay (Ventana Medical Systems, Tucson, Arizona) | √ | √ | √ |
| IMvigor211 [S-[136](#_ENREF_136)] | Multicenter, OL, phase 3, randomized controlled trial | ATEZO or chemotherapy (physician's choice: vinflunine, paclitaxel, or DTX) | ≤ 3 | PD-L1 | IC 2/3 ≥ 5%; IC 1/2/3 ≥ 1% | VENTANA SP142 PD-L1 immunohistochemistry assay (Ventana Medical Systems, Tucson, Arizona) | √ | √ | √ |
| TMB | High (at or above median); low (less than median) | DNA extraction and preparation done with HistoGeneX NV (Antwerp, Belgium), DNA sequencing, genomic alteration detection, and FoundationOne test done by Foundation Medicine (Cambridge, Massachusetts) | √ |  |  |
| PD-L1 + TMB | IC 2/3 + high (at or above median);IC 0/1 + high (at or above median) | VENTANA SP142 PD-L1 immunohistochemistry assay (Ventana Medical Systems, Tucson, Arizona)DNA extraction and preparation done with HistoGeneX NV (Antwerp, Belgium) DNA sequencing, genomic alteration detection and FoundationOne test done by Foundation Medicine (Cambridge, Massachusetts) | √ |  |  |
| JAVELIN Solid Tumor [S-[140](#_ENREF_140)] | Dose-expansion cohort of a multicenter, OL, phase 1 study | AVE | ≥ 1 | PD-L1 | < 5%; ≥ 5% | Clone 73-10 |  |  | √ |
| KEYNOTE-045 [S-[141](#_ENREF_141), [142](#_ENREF_142)] | Randomized, OL, phase 3 trial | PEM or chemotherapy | 2 | PD-L1 | < 1%; ≥ 1%; < 10%; ≥ 10% | PD-L1 IHC 22C3 pharmDx assay (Dako North America, Carpinteria, California) | √ | √ | √ |
| KEYNOTE-052 [S-[143](#_ENREF_143), [144](#_ENREF_144)] | OL, multicenter, phase 2 study | PEM | 1 | PD-L1 | 18-gene expression profile and CPS; CPS ≥ 10%; CPS ≥ 1%; CPS ≥ 10% | NR |  |  | √ |
| NCT01375842 Petrylak et al. (2015) [S-[145](#_ENREF_145)] | Phase 1, single arm, dose escalation with expansion cohorts | ATEZO | NR | PD-L1 | IC 2/3; IC 0/1 | SP142 assay |  | √ | √ |
| CheckMate-032, IMvigor210, CA209-260 [S-[146](#_ENREF_146)] | Phase 2 randomized controlled trials | Anti–PD-1/ PD-L1 monotherapy | ≥ 1 | DNA damage response and repair | Deleterious; other; wild type  | Memorial Sloan Kettering Integrated Molecular Profiling of Actionable Cancer Targets clinical sequencing assay | √ | √ |  |
| **SCCHN** |
| CheckMate 141 [S-[147-150](#_ENREF_147)] | Phase 3, randomized controlled trial | NIVO or standard therapy | Mixed | PD-L1 | ≥ 1%; ≥ 5%; ≥ 10%; < 1%; < 5%; < 10% | IHC assay (Dako North America, Carpinteria, California) antihuman PD-L1 mAb (clone 28–8) | √ | √ | √ |
| p16 | Positive; negative | NR | √ |  | √ |
| p16 and PD-L1 | Positive and ≥ 1%; negative and ≥ 1%; positive and < 1%; negative and < 1% | NR | √ |  |  |
| KEYNOTE-012 [S-[151](#_ENREF_151), [152](#_ENREF_152)] | Phase 1b, multicenter, nonrandomized multicohort study | PEM | ≥ 1 | PD-L1 | ≥ 1%; < 1% | PD-L1 IHC 22C3 pharmDx assay (Dako North America, Carpinteria, California) 22C3 (Merck) anti–PD-L1 antibody | √ | √ | √ |
| **Classical Hodgkin's lymphoma** |
| CheckMate 205 [S-[153](#_ENREF_153), [154](#_ENREF_154)] | Noncomparative, single-arm, phase 2 study | NIVO  | ≥ 2 | 9p24·1 | Polysomy; copy gain; amplification | NR |  |  | √ |
| PD-L1 | Q1; Q2; Q3; Q4 | FISH with probes targeting PD-L1 (*CD274*), PD-L2 (*PDCD1LG2*) (both Empire Genomics, Williamsville, New York), and a centromeric region of chromosome 9 (*CEP 9*, control probe; Abbott Molecular, Des Plaines, Illinois) |  |  | √ |
| **Pancreatic** |
| De Remigis et al. (2015) [S-[155](#_ENREF_155)] | Cohort study | GVAX or GVAX + IPI | NR | Thyroglobulin antibody seroconversion | Positive; negative | In-house ELISA and commercial ELISA QUANTA Lite and RIA KRONUS (Star, Idaho) thyroglobulin antibodies | √ |  |  |
| **Metastatic triple-negative breast cancer** |
| KEYNOTE-086 [S-[156](#_ENREF_156)] | Phase 2, OL trial | PEM | ≥ 1 | PD-L1 | Positive and negative | NR | √ | √ | √ |
| **Multiple** |
| ***Melanoma, renal cell carcinoma, and NSCLC*** |
| NCT01375842 Herbst et al. (2014) [S-[57](#_ENREF_57), [58](#_ENREF_58), [121](#_ENREF_121), [145](#_ENREF_145)] | Phase 1, single arm, dose escalation with expansion cohorts | ATEZO | NR | PD-L1 | < 1%; 1% to < 5%; 5% to < 10%; ≥ 10%; increase in PD-L1 TC or IC of > 5% in patients with paired biopsies | SP142 assay |  | √ | √ |
| ***Metastatic tumors including breast, gastric, urothelial, and colorectal tumors*** |
| Ayers et al. (2016) [S-[157](#_ENREF_157)] | Retrospective of KEYNOTE-012 and KEYNOTE-028 | PEM | NR | MSI-H | MSI-H; non-MSI-H | Microsatellite markers were analyzed by capillary electrophoresis |  |  | √ |
| ***SCLC, melanoma, and SCCHN*** |
| Navarro et al. (2016) [S-[158](#_ENREF_158)] | Retrospective study | PEM, NIVO, or ATEZO | ≥ 1 | Immune gene signature | All signaturesT helper cells 1 high-tertile groupT helper cells 1 low-tertile group | RNA was analyzed using the NanoString PanCancer Immune Panel (NanoString Technologies, Seattle, Washington) |  | √ | √ |
| ***NSCLC, SCCHN, and melanoma*** |
| Prat et al. (2017) [S-[159](#_ENREF_159)] | Retrospective of clinical trials | NIVO or PEM | ≥ 1 | Natural killer-cell expression | Low; high | Expression of 730 immune-related genes and 40 housekeeping genes using the nCounter platform (NanoString Technologies, Seattle, Washington) |  | √ |  |
| ***Any solid tumor with stage IV disease*** |
| Yaghmour et al. (2016) [S-[68](#_ENREF_68)] | Retrospective database search | NIVO, PEM, or IPI | ≥ 1 | TML | Top quintile; other quintiles combined | NR | √ | √ | √ |
| PD-L1 | Positive; negative | IHC by the individual commercial labs | √ |  |  |
| PD-1 | Positive; negative | √ |  |  |
| ***NSCLC, mUC, or other advanced solid tumors*** |
| FIR, BIRCH, POPLAR, OAK, IMVIGOR, PCD4989g [S-[160](#_ENREF_160)] | NR | ATEZO | ≥ 1 | Tissue TMB  | ≥ 16 mutations per mb; < 16 mutations per mb | FoundationOne assay (Foundation Medicine, Cambridge, Massachusetts) |  |  | √ |

AEC = absolute eosinophil count; AKT = protein kinase B; ALC = absolute lymphocyte count; ALK = anaplastic lymphoma kinase; AMC = absolute monocyte count; ANGPT2 = angiopoietin-2 precursor; ATEZO = atezolizumab; AVE= avelumab; BEV= bevacizumab; bTMB = blood tumor mutational burden; CD25 = cluster of differentiation 25/interleukin 2 receptor alpha; CFB = change from baseline; CPS = combined positive score; CRP = C-reactive protein; CTLA-4 = cytotoxic T-lymphocyte–associated protein 4; *CXCL9* = chemokine (C-X-C) motif ligand 9; DB= double-blind; DNA = deoxyribonucleic acid; DTX = docetaxel; DURVA = durvalumab; EGFR = epidermal growth factor receptor; ELISA = enzyme-linked immunosorbent assay; FISH = fluorescence in situ hybridization; *FOXP3* = Forkhead Box P3; GVAX = pancreatic cancer vaccine; HLA = human leukocyte antigen; HLA-DR = human leukocyte antigen-D related; IC = immune cell; IFN-γ = interferon gamma; IFNGS = interferon gene signature; IHC = immunohistochemistry; IPI = ipilimumab; *KRAS* = KRAS Proto-Oncogene, GTPase; *LAG3* = lymphocyte-activation gene 3; LDH = lactate dehydrogenase; mAb = monoclonal antibody; MAGE-3 = melanoma-associated antigen 3; MART-1 = melanoma antigen recognized by T cells 1; mb= megabase; MCPyV = Merkel cell polyomavirus; MDSC = myeloid-derived suppressor cell; MEK = mitogen-activated protein kinase enzyme; MIA = multiplex immunoassay; MICA = major histocompatibility complex class I-related chain A; mRNA = messenger ribonucleic acid; MSI-H = high-level microsatellite instability; mUC = metastatic urothelial cancer; NGS = next-generation sequencing; NIVO= nivolumab; NR = not reported; NSCLC = non–small cell lung cancer; OL = open-label; OS = overall survival; p-AKT = phospho-AKT; p‑S6 = phospho-S6 ribosomal protein; PBO = placebo; PCR = polymerase chain reaction; PD-1 = programmed cell death protein 1; PD-L1 = programmed cell death ligand 1; PD-L2 = programmed cell death ligand 2; PEM= pembrolizumab; PFS = progression-free survival; Q = quarter; RCT= randomized controlled trial; REC = relative eosinophil count; RLC = relative lymphocyte count; RNA = ribonucleic acid; RT-PCR = reverse transcription polymerase chain reaction; SCCHN = squamous-cell carcinoma of the head and neck; SCLC = small cell lung cancer; SOC = standard of care; TC = tumor cell; TCM = central memory T cell; TEM1 = effector memory T cell-1; TEM3 = effector memory T cell-3; TEM4 = effector memory T cell-4; TEMRA = effector memory T cell RA; TIM3 = T‑cell immunoglobulin and mucin-domain containing-3; TMB = tumor mutational burden; TML = tumor mutational load; ULN = upper limit of normal; VEGF = vascular endothelial growth factor.

a Defined as the number of somatic, coding base substitutions and short insertions and deletions per megabase of genome examined.

Table S2. PD-L1: OS and PFS Data in NSCLC

| Trial Acronym/ Author (Year) | Population | Treatment | No. of Patients | OS | PFS |
| --- | --- | --- | --- | --- | --- |
| Median (95% CI), Months | HR(95% CI) | Median (95% CI), Months | HR(95% CI) |
| BIRCH [S-[1-3](#_ENREF_1)] | PD-L1 ≥ 50%  | First-line ATEZO | 65 | NE (12-NE) | NR | 5.6 (2.7-8.3) | NR |
| Second-line ATEZO  | 122 | 15.1 (12-NE) | NR | 4 (1.5-5.5) | NR |
| ≥ Third ATEZO  | 115 | 17.5 (11.1-NE) | NR | 4.1 (2.8-5.6) | NR |
| PD-L1 10-49%  | First-line ATEZO  | 74 | 20.1 (NE) | NR | 5.3 (2.8-6.9) | NR |
| Second-line ATEZO  | 146 | 15.5 (11.9-NE) | NR | 2.6 (1.4-2.8) | NR |
| ≥ Third ATEZO  | 136 | 11 (7.5-14.9) | NR | 2.7 (1.5-2.8) | NR |
| PD-L1 TC 3 or IC 3 | First-line ATEZO | 65 | 26.9 (12-NE) | NR | 7.3 (4.9-12) | NR |
| PD-L1 TC 2 or IC 2b | 73 | 23.5 (18.1-NE) | NR | 7.6 (4-9.7) | NR |
| CheckMate 012 [S-[4](#_ENREF_4), [5](#_ENREF_5)] | PD-L1 ≥ 1% | NIVO 10 mg/kg | 23 | 20.2 (NR) | NR | 6 (NR) | NR |
| PD-L1 < 1 % | 21 | 19.2 (NR) | NR | 5.2 (NR) | NR |
| CheckMate 017 [S-[6](#_ENREF_6)] | PD-L1 < 1% | NIVO 3 mg/kg | 54 | 8.7 (NR) | 0.58 (0.58-0.92) | 3.1 (NR) | 0.66 (0.43-1.0) |
| DTX 75 mg/mg | 52 | 5.9 (NR) | 3 (NR) |
| PD-L1 ≥ 1% | NIVO 3 mg/kg | 63 | 9.3 (NR) | 0.69 (0.45-1.1) | 3.3 (NR) | 0.67 (0.44-1.0) |
| DTX 75 mg/m2 | 56 | 7.2 (NR) | 2.8 (NR) |
| PD-L1 < 5% | NIVO 3 mg/kg | 75 | 8.5 (NR) | 0.7 (0.47-1.0) | 2.2 (NR) | 0.75 (0.52-1.1) |
| DTX 75 mg/m2 | 69 | 6.4 (NR) | 2.9 (NR) |
| PD-L1 ≥ 5% | NIVO 3 mg/kg | 42 | 10 (NR) | 0.53 (0.31-0.89) | 4.8 (NR) | 0.54 (0.32-0.9) |
| DTX 75 mg/m2 | 39 | 6.1 (NR) | 3.1 (NR) |
| PD-L1 < 10% | NIVO 3 mg/kg | 81 | 11 (NR) | 0.7 (0.48-1.0) | 2.3 (NR) | 0.7 (0.49-0.99) |
| DTX 75 mg/m2 | 75 | 6.1 (NR) | 2.8 (NR) |
| PD-L1 ≥ 10% | NIVO 3 mg/kg | 36 | 8.2 (NR) | 0.5 (0.28-0.89) | 3.7 (NR) | 0.58 (0.33-1.0) |
| DTX 75 mg/m2 | 33 | 7.1 (NR) | 3.3 (NR) |
| CheckMate 026 [S-[9](#_ENREF_9), [10](#_ENREF_10)] | PD-L1 > 1%  | NIVO 3 mg/kg  | 271 | 13.7 (11.8-15.4) | 1.07 (0.86-1.33) | 4.2 (3.1-5.5) | 1.17 (0.95-1.43) |
| Platinum-based CT  | 270 | 13.8 (11-17) | 5.8 (5.4-6.9) |
| PD-L1 ≥ 5% | NIVO 3 mg/kg  | 211 | 14.4 (11.7-17.4) | 1.02 (0.8-1.3) | 4.2 (3.0-5.6) | 1.15 (0.91-1.45) |
| Platinum-based CT | 212 | 13.2 (10.7-17.1) | 5.9 (5.4-6.9) |
| PD-L1 ≥ 50% | NIVO 3 mg/kg  | 88 | 15.9 (NR) | 0.9 (0.63-1.29) | 5.4 (NR) | 1.07 (0.77-1.49) |
| Platinum-based CT | 126 | 13.9 (NR) | 5.8 (NR) |
| CheckMate 057 [S-[11-13](#_ENREF_11)] | PD-L1 < 1% | NIVO 3 mg/kg  | 108 | 10.5 (NR) | 0.9 (0.66-1.24) | 2.1 | 1.19 (0.88-1.61) |
| DTX 75 mg/m2  | 101 | 10.1 (NR) | 3.6 |
| PD-L1 ≥ 1% | NIVO 3 mg/kg  | 123 | 17.7 (NR) | 0.59 (0.43-0.82) | 4.2 | 0.7 (0.53-0.94) |
| DTX 75 mg/m2  | 123 | 9 (NR) | 4.5 |
| PD-L1 < 5% | NIVO 3 mg/kg  | 136 | 9.8 (NR) | 1.01 (0.77-1.34) | 2.1 | 1.31 (1.01-1.71) |
| DTX 75 mg/m2  | 138 | 10.1 (NR) | 4.2 |
| PD-L1 ≥ 5% | NIVO 3 mg/kg  | 95 | 19.4 (NR) | 0.43(0.30-0.63) | 5 | 0.54 (0.39-0.76) |
| DTX 75 mg/m2  | 86 | 8.1 (NR) | 3.8 |
| PD-L1 < 10% | NIVO 3 mg/kg  | 145 | 9.9 (NR) | 1 (0.76-1.31) | 2.1 | 1.24 (0.96-1.61) |
| DTX 75 mg/m2  | 145 | 10.3 (NR) | 4.2 |
| PD-L1 ≥ 10% | NIVO 3 mg/kg | 86 | 19.9 (NR) | 0.4 (0.26-0.59) | 5 | 0.52 (0.37-0.75) |
| DTX 75 mg/m2  | 79 | 8 (NR) | 3.7 |
| CP1108 [S-[16-22](#_ENREF_16)] | PD-L1 TC ≥ 25% | Second line, DURVA  | 46 | 17.8 (7.9-22.4) | NR | NR | NR |
| PD-L1 TC < 25% | 24 | 8.2 (4.9-15.5) | NR | NR | NR |
| PD-L1 TC ≥ 25% | ≥ Third line, DURVA  | 59 | 13 (6-NE) | NR | NR | NR |
| PD-L1 TC < 25% | 82 | 7.1 (4.3-10) | NR | NR | NR |
| IFN-ɣ mRNA any and PD-L1 IHC+ (≥ 25%) | Mixed line, DURVA  | 43 | NE (8.8-NE) | 0.4 | NR | NR |
| IFN-ɣ mRNA any and PD-L1 IHC– | 20 | NE (6.5-NE) | 0.38 | NR | NR |
| IFN-ɣ mRNA any and PD-L1 IHC+ (≥25%) | 42 | 9.7 (8.8-NE) | 0.64 | NR | NR |
| IFN-ɣ mRNA any and PD-L1 IHC– | 52 | 5.9 (4.1-10.2) | NR | NR | NR |
| PD-L1 (high): ≥ 25% of TC expressed PD‑L1 | First line, DURVA  | 109 | 15.4 (9.7-22.4) | NR | NR | NR |
| PD-L1 (low/negative): < 25% of TC | 108 | 7.6 (5.6-10) | NR | NR | NR |
| JAVELIN Solid Tumor [S-[23-32](#_ENREF_23)] | PD-L1 ≥ 1% positive | ≥ Second line, AVE | 122 | 8.9 (8-NE) | 0.64 (0.34-1.2) | 2.8 (2.4-4.1) | 0.4 (0.27-0.75) |
| PD-L1 ≥ 1% negative | 20 | 4.6 (2.8-NE) | 1.4 (1.3-1.6) |
| PD-L1 ≥ 5% positive | 84 | 10.6 (7.9-NE) | 1.14 (0.7-1.02) | 2.7 (1.5-4.2) | NR |
| PD-L1 ≥ 5% negative | 58 | 8.4 (5.6-NE) | 1.8 (1.4-2.8) | NR |
| PD-L1 ≥ 25% positive | 53 | 8.44 (6-NE) | 1.14 (0.7-1.85) | 2.7 (1.5-4.2) | 0.79 (0.53-1.18) |
| PD-L1 ≥ 25% negative | 89 | 8.57 (7.16-NE) | 2.5 (1.4-3.2) |
| PD-L1 ≥ 10% positive | 27 | 8.5 (3.9-NE) | 1.2 (0.68-2.14) | 1.9 (1.3-3.5) | 1.19 (0.74-1.92) |
| PD-L1 ≥ 10% negative | 115 | 8.9 (7.9-NE) | 2.6 (1.5-3.5) | NR |
| KEYNOTE-001 [S-[33-40](#_ENREF_33)] | PD-L1: PS ≥ 50% training group | ≥ First line, PEM 2 mg/kg Q3W or 10 mg/kg Q3W or 10 mg/kg Q2W  | 38 | 13.7 (6.9-NE) | NR | 4.5 (1.9-12.5) | NR |
| PD-L1: PS 1%-49% training group | 43 | 5.9 (4.2-8.2) | NR | 2.1 (2-2.9) | NR |
| PD-L1: PS < 1% training group | 40 | 6.7 (3.9-10) | NR | 2.1 (1.8-2.5) | NR |
| PD-L1: PS ≥ 50% validation group | 73 | NE (NE-NE) | NR | 6.4 (4.2-NE) | NR |
| PD-L1: PS 1%-49% validation group | 103 | 10.6 (7.3-NE) | NR | 4.1 (2.3-4.4) | NR |
| PD-L1: PS < 1% validation group | 28 | 10.4 (7.3-NE) | NR | 4 (2.1-6.2) | NR |
| PD-L1 positive: overall | 101 | 22.1 (17.1-27.2) | NR | 6.2 (4.1-8.6) | NR |
| PD-L1 positive: TPS ≥ 50% | 27 | NE (22.1-NE) | NR | 12.5 (6.2-NE) | NR |
| PD-L1 positive: TPS 1%-49% | 52 | 19.5 (10.7-22.2) | NR | 4.2 (3.1-6.4) | NR |
| PD-L1 positive: TPS < 1% | 12 | 14.7 (3.4-NE) | NR | 3.5 (2.1-19) | NR |
| PD-L1: TPS ≥ 1% | 79 | 22.2 (16.7-31.5) | NR | NR | NR |
| PD-L1: TPS ≥ 50% | 27 | 34.9 (20.3-NE) | NR | NR | NR |
| PD-L1: TPS 1%-49% | 52 | 19.5 (10.7-26.3) | NR | NR | NR |
| PD-L1: TPS ≥ 1% | 306 | 11.1 (8.3-14) | NR | NR | NR |
| PD-L1: TPS ≥ 50% | 138 | 15.4 (10.5-18.5) | NR | NR | NR |
| PD-L1: TPS 1%-49% | 90 | 8.5 (6-12.7) | NR | NR | NR |
| PD-L1: TPS < 1% | 90 | 8.6 (5.5-10.6) | NR | NR | NR |
| PD-L1: TPS ≥ 1% | 79 | 22.1 (16.7-27.2) | NR | NR | NR |
| PD-L1: TPS ≥ 50% | 27 | NE (22.1-NE) | NR | NR | NR |
| PD-L1: TPS 1%-49% | 52 | 19.5 (10.7-22.2) | NR | NR | NR |
| PD-L1: TPS < 1% | 12 | 14.7 (3.4-NE) | NR | NR | NR |
| PD-L1: TPS ≥ 1% | 306 | 11.3 (8.3-14) | NR | NR | NR |
| PD-L1: TPS ≥ 50% | 138 | 15.4 (10.6-18.5) | NR | NR | NR |
| PD-L1: TPS 1%-49% | 168 | 8.2 (6-12.7) | NR | NR | NR |
| PD-L1: TPS < 1% | 90 | 8.6 (5.5-12) | NR | NR | NR |
| PD-L1 ≥ 50% | 17 | NE (NE-NE) | NR | NE (2.4-NE) | NR |
| PD-L1 1%-49% | 31 | NE (8.6-NE) | NR | 4.4 (3.6-6.4) | NR |
| PD-L1 < 1% | 7 | 7.3 (3.4-NE) | NR | 3.4 (2.1-4.2) | NR |
| KEYNOTE-010 [S-[41-44](#_ENREF_41)] | PD-L1: TPS ≥ 1% | > First line, PEM 2 mg/kg Q3W | 344 | 10.4 (9.4-11.9) | 0.71 (0.58-0.88) | 3.9 (3.1-4.1) | 0.88 (0.74-1.05) |
| PD-L1: TPS ≥ 1% | > First line, PEM 10 mg/kg Q3W | 346 | 12.7 (10-17.3) | 0.61 (0.49-0.75) | 4 (2.7-4.3) | 0.79 (0.66-0.94) |
| PD-L1: TPS ≥ 1% | > First line, DTX 75 mg/m2 Q3W | 343 | 8.5 (7.5-9.8) | 4 (3.1-4.2) |
| PD-L1: TPS ≥ 50% | > First line, PEM 2 mg/kg Q3W | 139 | 14.9 (10.4-NE) | 0.54 (0.38-0.77) | 5.2 (4.1-8.1) | 0.59 (0.44-0.78) |
| PD-L1: TPS ≥ 50% | > First line, PEM 10 mg/kg Q3W | 151 | 17.3 (11.8-NE) | 0.5 (0.36-0.7) | 4.1 (3.6-4.3) | 0.59 (0.45-0.78) |
| PD-L1: TPS ≥ 50% | > First line, DTX 75 mg/m2 Q3W | 152 | 8.2 (6.4-10.7) | NR |
| PD-L1: TPS ≥ 50% | > First line, PEM and DTX, 2 mg/kg Q3W or 10 mg/kg Q3W or 75 mg/m2 Q3W | 442 | NR | 0.53 (0.4-0.7) | NR | 0.59 (0.46-0.74) |
| PD-L1: TPS 1%-49% | 591 | NR | 0.76 (0.6-0.96) | NR | 1.04 (0.85-1.27) |
| PD-L1: TPS ≥ 50% | ≥ 1st line, PEM 2 mg/kg Q3W | NR | 14.9 (10.4-NR) | 0.54 (0.38-0.77) | NR | NR |
| PD-L1: TPS ≥ 50% | ≥ 1st line, DTX 75 mg/m2 Q3W | NR | 8.2 (6.4-10.7) | NR | NR |
| PD-L1: TPS 1%-24% | ≥ 1st line, PEM 2 or 10 mg/kg Q3W | 324 | 9.7 (NR-NR) | NR | 2.6 (NR-NR) | NR |
| PD-L1: TPS 25%-49% | 76 | 9.8 (NR-NR) | NR | 2.9 (NR-NR) | NR |
| PD-L1: TPS 50%-74% | 106 | 15.8 (NR-NR) | NR | 4.3 (NR-NR) | NR |
| PD-L1: TPS ≥ 75% | 184 | 16.6 (NR-NR) | NR | 6.2 (NR-NR) | NR |
| PD-L1: TPS 1%-24% | ≥ 1st line, PEM and DTX, 2 mg/kg Q3W or 10 mg/kg Q3W or 75 mg/m2 Q3W | 471 | NR | 0.74 (0.56-0.96) | NR | 1.08 (0.86-1.36) |
| PD-L1: TPS 25%-49% | 120 | NR | 0.86 (0.51-1.45) | NR | 0.95 (0.6-1.5) |
| PD-L1: TPS 50%-74% | 158 | NR | 0.58 (0.36-0.95) | NR | 0.78 (0.52-1.17) |
| PD-L1: TPS ≥ 75% | 284 | NR | 0.51 (0.36-0.73) | NR | 0.52 (0.38-0.69) |
| PD-L1: TPS 1%-24% | ≥ First line, DTX 75 mg/m2 Q3W | 147 | 8.5 (NR-NR) | NR | 4 (NR-NR) | NR |
| PD-L1: TPS 25%-49% | 44 | 9.9 (NR-NR) | NR | 3.8 (NR-NR) | NR |
| PD-L1: TPS 50%-74% | 52 | 8.2 (NR-NR) | NR | 4.3 (NR-NR) | NR |
| PD-L1: TPS ≥ 75% | 100 | 8.2 (NR-NR) | NR | 4 (NR-NR) | NR |
| PD-L1: TPS ≥ 50% (archival) | 119 | 11.5 (NR-NR) | NA | 3.9 (NR-NR) | NA |
| PD-L1: TPS ≥ 50% (new tissue) | ≥ First line, DTX 75 mg/m2 Q3W | 171 | NE (NR-NR) | NA | 6.3 (NR-NR) | NA |
| PD-L1: TPS ≥ 1% (archival) | 300 | 10.5 (NR-NR) | NA | 2.9 (NR-NR) | NA |
| PD-L1: TPS ≥ 1% (new tissue) | 390 | 12.6 (NR-NR) | NA | 4.1 (NR-NR) | NA |
| PD-L1: TPS ≥ 50% (archival) | ≥ First line, PEM and DTX, 2 mg/kg Q3W or 10 mg/kg Q3W or 75 mg/m2 Q3W | 184 | NA (NA-NA) | 0.6 (0.4-0.9) | NA | 0.64 (0.45-0.9) |
| PD-L1: TPS ≥ 50% (new tissue) | ≥ First line, PEM and DTX, 2 mg/kg Q3W or 10 mg/kg Q3W or 75 mg/m2 Q3W | 258 | NA (NA-NA) | 0.44 (0.29-0.66) | NA | 0.54 (0.39-0.75) |
| PD-L1: TPS ≥ 1% (archival) | 455 | NA (NA-NA) | 0.7 (0.54-0.89) | NA | 0.81 (0.65-1.01) |
| PD-L1: TPS ≥ 1% (new tissue) | 578 | NA (NA-NA) | 0.64 (0.5-0.83) | NA | 0.86 (0.7-1.07) |
| PD-L1: TPS ≥ 50% (archival) | ≥ First line, DTX 75 mg/m2 Q3W | 65 | 7.4 (NR-NR) | NA | 4 (NR-NR) | NA |
| PD-L1: TPS ≥ 50% (new tissue) | 87 | 8.3 (NR-NR) | NA | 4.3 (NR-NR) | NA |
| PD-L1: TPS ≥ 1% (archival) | 155 | 8.3 (NR-NR) | NA | 3.8 (NR-NR) | NA |
| PD-L1: TPS ≥ 1% (new tissue) | 188 | 8.6 (NR-NR) | NA | 4.2 (NR-NR) | NA |
| OAK [S-[45-49](#_ENREF_45)] | PD-L1 ≥ 50% | ATEZO  | 72 | 20.5 (17.5-NE) | 0.41 (0.27-0.64) | 4.2 (2.9-7) | 0.63 (0.43-0.91) |
| DTX  | 65 | 8.9 (5.6-11.6) | 3.3 (2.7-4.2) |
| PD-L1 ≥ 5% | ATEZO  | 129 | 16.3 (13.3-20.1) | 0.67 (0.49-0.90) | 4.1 (2.8-5.3) | 0.76 (0.58-0.99) |
| DTX  | 136 | 10.8 (8.8-12.7) | 3.6 (2.8-4.2) |
| PD-L1 ≥ 1% | ATEZO  | 241 | 15.7 (12.6-18.0) | 0.74 (0.58-0.93) | 2.8 (2.6-4.0) | 0.91 (0.74-1.12) |
| DTX  | 222 | 10.3 (8.8-12.0) | 4.1 (2.9-4.3) |
| PD-L1 < 1% | ATEZO  | 180 | 12.6 (9.6-15.2) | 0.75 (0.59-0.96) | 2.6 (1.7-2.9) | 1 (0.8-1.25) |
| DTX  | 199 | 8.9 (7.7-11.5) | 4 (3.1-4.2) |
| PD-L1 ≥ 50% (nonsquamous) | ATEZO  | 49 | 22.5 (NR) | 0.35 (0.21-0.61) | NR | NR |
| DTX  | 47 | 8.7 (NR) | NR | NR |
| PD-L1 ≥ 5% (nonsquamous) | ATEZO  | 89 | 18.7 (NR) | 0.61 (0.42-0.88) | NR | NR |
| DTX  | 99 | 11.3 (NR) | NR | NR |
| PD-L1 ≥ 1% (nonsquamous) | ATEZO  | 171 | 17.6 (NR) | 0.72 (0.55-0.95) | NR | NR |
| DTX  | 162 | 11.3 (NR) | NR | NR |
| PD-L1 < 1% (nonsquamous) | ATEZO  | 140 | 14 (NR) | 0.75 (0.57-1.0) | NR | NR |
| DTX  | 150 | 11.2 (NR) | NR | NR |
| PD-L1 ≥ 50% (squamous) | ATEZO  | 23 | 17.5 (NR) | 0.57 (0.27-1.2) | NR | NR |
| DTX  | 18 | 11.6 (NR) | NR | NR |
| PD-L1 ≥ 5% (squamous) | ATEZO  | 40 | 10.4 (NR) | 0.76 (0.45-1.29) | NR | NR |
| DTX  | 37 | 9.7 (NR) | NR | NR |
| PD-L1 ≥ 1% (squamous) | ATEZO  | 70 | 9.9 (NR) | 0.71 (0.48-1.06) | NR | NR |
| DTX  | 60 | 8.7 (NR) | NR | NR |
| PD-L1 < 1% (squamous) | ATEZO  | 40 | 7.6 (NR) | 0.82 (0.51-1.32) | NR | NR |
| DTX  | 49 | 7.1 (NR) | NR | NR |
| PD-L1 ≥ 1% (Japanese)  | ATEZO  | 11 | 21.3 (15-NE) | 0.81 (0.22-3.05) | 4.2 (2.9-10.2) | 1.18 (0.44-3.16) |
| DTX  | 8 | NE (NE-NE) | 5.6 (4.2-8.8) |
| PD-L1 < 1% (Japanese) | ATEZO  | 25 | 20.9 (7.8-NE) | 0.79 (0.36-1.73) | 4 (1.5-4.4) | 1.45 (0.78-2.69) |
| DTX  | 20 | 17 (12-NE) | 4.2 (2.9-5.8) |
| POPLAR [S-[49-54](#_ENREF_49)] | PD-L1 ≥ 50%  | ATEZO  | 24 | 15.5 (9.8-NE) | 0.49 (0.22-1.07) | 7.8 (2.7-12.3) | 0.6 (0.31-1.16) |
| DTX  | 23 | 11.1 (6.7-14.4) | 3.9 (1.9-5.7) |
| PD-L1 ≥ 5%  | ATEZO  | 50 | 15.1 (8.4-NE) | 0.54 (0.33-0.89) | 3.4 (1.4-6.9) | 0.72 (0.47-1.1) |
| DTX  | 55 | 7.4 (6.0-12.5) | 2.8 (1.9-3.9) |
| PD-L1 ≥ 1%  | ATEZO  | 93 | 15.5 (11-NE) | 0.59 (0.40-0.85) | 2.8 (2.6-5.5) | 0.85 (0.63-1.16) |
| DTX  | 102 | 9.2 (7.3-12.8) | 3 (2.8-4.1) |
| PD-L1 < 1%  | ATEZO  | 51 | 9.7 (6.7-12) | 1.04 (0.62-1.75) | 1.7 (1.4-4.2) | 1.12 (0.72-1.77) |
| DTX  | 41 | 9.7 (8.6-12) | 4.1 (2.7-5.6) |
| NCT00730639 Topalian et al. (2012) [S-[55](#_ENREF_55), [56](#_ENREF_56)] | PD-L1 ≥ 5% | NIVO 1.0, 3.0, or 10.0 mg/kg Q2W | 33 | 7.8 (5.6-21.7) | NR | 3.3 (1.8-7.5) | NR |
| PD-L1 < 5% | 35 | 10.5 (5.2-14.8) | NR | 1.8 (1.7-2.3) | NR |
| NCT01375842 [S-[57](#_ENREF_57), [58](#_ENREF_58)] | PD-L1 < 1% | ATEZO 0.01, 0.03, and 0.1 mg and 0.3, 1, 3, 10, and 20 mg/kg Q3W | 20 | NR | NR | 13 (6-37) | NR |
| PD-L1 1 ≤ 5% | 13 | NR | NR | 6 (5-43) | NR |
| PD-L1 5%-10% | 7 | NR | NR | 11 (1-17) | NR |
| PD-L1 ≥ 10% | 6 | NR | NR | NE (5-NE) | NR |
| Kaderbhai (2017) [S-[62](#_ENREF_62)] | PD-L1 ≥ 1% | NIVO  | 33 | NR | 1.4 (0.63-3.09) | NR | 0.97 (0.55-1.69) |
| PD-L1 < 1% | 33 | NR | NR |
| Sorensen et al. (2016) [S-[67](#_ENREF_67)] | PD-L1 ≥ 50%, all patients | PEM + platinum-doublet chemotherapy as initial therapy | 51 | 9 (6.4-11.1) | 1.36 (0.9-2.06) | NR | NR |
| PD-L1 ≥ 50%, adenocarcinoma  | NR | 10.9 (6.9-13.3) | 1.31 (0.76-2.27) | NR | NR |
| PD-L1 ≥ 50%, squamous-cell carcinoma  | NR | 7.2 (0.9-10.2) | 3.87 (1.05-14.26) | NR | NR |
| PD-L1 1%-49%, all patients | 102 | 9.8 (8.2-12.3) | 1.09 (0.76-1.58) | NR | NR |
| PD-L1 1%-49%, adenocarcinoma | NR | 12.1(8.5-15.0) | 0.84 (0.53-1.34) | NR | NR |
| PD-L1 1%-49%, squamous-cell carcinoma | NR | 8.8 (6.1-12.2) | 2.36 (0.84-6.63) | NR | NR |
| PD-L1 < 1%, all patients  | 51 | 7.5 (6.4-12.4) | NR | NR | NR |
| PD-L1 < 1%, adenocarcinoma  | NR | 10.7 (7.1-16.4) | NR | NR | NR |
| PD-L1 < 1%, squamous-cell carcinoma | NR | 19.9 (3.3-NE) | NR | NR | NR |
| PD-L1 ≥ 1%, all patients  | NR | 9.3 (7.8-11.0) | 1.17 (0.83-1.66) | NR | NR |
| PD-L1 ≥ 1%, adenocarcinoma  | NR | 11.1(9.2-13.3) | 0.96 (0.62-1.48) | NR | NR |
| PD-L1 ≥ 1%, squamous-cell carcinoma  | NR | 8.4 (6.6-9.8) | 2.4 (0.87-6.6) | NR | NR |
| Yaghmour (2016) [S-[68](#_ENREF_68)] | PD-1 positive | ≥ First line, NIVO or IPI  | 50 overall patients | 7.5 (NR-NR) | 1.53 (0.38-7.58) | NR | NR |
| PD-1 negative | Undefined (NR-NR) | NR | NR |
| PD-L1 positive | 7.5 (NR-NR) | 1.76 (0.5-6.85) | NR | NR |
| PD-L1 negative | Undefined(NR-NR) | NR | NR |

ATEZO = atezolizumab; AVE= avelumab; CI = confidence interval; CT = chemotherapy; DTX = docetaxel; DURVA = durvalumab; HR = hazard ratio; IC = immune cell; IFN = interferon; IFN-γ = interferon gamma; IHC = immunohistochemistry; IPI = ipilimumab; mRNA = messenger RNA; NA =not applicable ; NE = not estimable/not reached; NIVO= nivolumab; NR = not reported; OS = overall survival; PD-1 = programmed cell death protein 1; PD-L1 = programmed cell death ligand 1; PEM = pembrolizumab; PFS = progression-free survival; PS = proportion score; Q2W = every 2 weeks; Q3W = every 3 weeks; TC = tumor cell; TPS = tumor proportion score.

Table S3. PD-L1 and TMB: OS and PFS Data in NSCLC

| Trial Acronym | Population | Treatment | No. of Patients | OS | PFS |
| --- | --- | --- | --- | --- | --- |
| Median (95% CI), Months | HR(95% CI) | Median (95% CI), Months | HR(95% CI) |
| CheckMate 227 [S-[15](#_ENREF_15)] | ≥ 10 mutations per megabase + PD-L1 ≥ 1% | Chemotherapy | 112 | NR | NR | NR | NR (NR-NR) |
| NIVO + IPI | 101 | NR | NR | 7.1 (5.5-13.5) | 0.75 (0.53-1.07) |
| NIVO | 102 | NR | NR | 4.2 (2.6-8.3) |
| ≥ 10 mutations per megabase + PD-L1 < 1% | NIVO + IPI | 38 | NR | NR | NR | 0.48 (0.27-0.85) |
| Chemotherapy | 48 | NR | NR | NR |
| ≥ 13 mutations per megabase + PD-L1 ≥ 1% | NIVO | 71 | NR | NR | 4.2 (2.7-8.3) | 0.95 (0.64-1.4) |
| Chemotherapy | 79 | NR | NR | 5.6 (4.5-7) |

CI = confidence interval; HR = hazard ratio; IPI = ipilimumab; NIVO = nivolumab; NR = not reported; NSCLC = non–small-cell lung cancer; OS = overall survival; PD-L1 = programmed cell death ligand 1; PFS = progression-free survival; TMB = tumor mutational burden.

Supplementary Table S4. PD-L1: OS and PFS Data in Melanoma

| Trial Acronym | Population | Treatment | No. of Patients | OS | PFS |
| --- | --- | --- | --- | --- | --- |
| Median (95% CI), Months | HR(95% CI) | Median (95% CI), Months | HR(95% CI) |
| CheckMate 066 [S-[75](#_ENREF_75)] | PD-L1 ≥ 5%  | NIVO 3 mg/kg Q2W | 74 | NE (NE) | NR | NR | NR |
| PD-L1 < 5% | 128 | NE (NE) | NR | NR | NR |
| PD-L1 ≥ 5% | Dacarbazine 100 mg/m2 Q3W | 74 | 12.4 (9.2 -NE) | NR | NR | NR |
| PD-L1 < 5% | 126 | 10.2 (7.6-11.8) | NR | NR | NR |
| CheckMate 066/067/069 [S-[76](#_ENREF_76)] | PD-L1 ≥ 5% | NIVO 1 mg/kg + IPI 3 mg/kg Q3W | 832 (overall patients) | NR | NR | NE | 0.99 (0.66-1.46) |
| NIVO 3 mg/kg Q2W | NR | NR | 22 |
| PD-L1 < 5% | NIVO 1 mg/kg + IPI 3 mg/kg Q3W  | NR | NR | 11.1 | 0.7 (0.57-0.87) |
| NIVO 3 mg/kg Q2W | NR | NR | 4.9 |
| CheckMate 067 [S-[77-79](#_ENREF_77)] | PD-L1 ≥ 5% | NIVO 3 mg/kg Q2W | 80 | NR | NR | 14 (9.1-NE) | NR |
| NIVO 1 mg/kg + IPI 3 mg/kg Q3W | 68 | NR | NR | 14 (9.7-NE) | NR |
| IPI 3 mg/kg Q3W | 75 | NR | NR | 3.9 (2.8-4.2) | NR |
| PD-L1 < 5% | NIVO 3 mg/kg Q2W | 208 | NR | NR | 5.3 (2.8-7.1) | NR |
| NIVO 1 mg/kg + IPI 3 mg/kg Q3W | 210 | NR | NR | 11.2 (8.0-NE) | NR |
| IPI 3 mg/kg Q3W | 202 | NR | NR | 2.8 (2.8 to NE) | NR |
| KEYNOTE-001 [S-[33-40](#_ENREF_33), [82](#_ENREF_82)] | PD-L1 ≥ 1%  | PEM 2 mg/kg Q3W or 10 mg/kg Q2W or Q3W | 344 | 29.9 (24.6-NE) | 0.5 (0.37-0.67) | 5.6 (4.4-8.1) | 0.51 (0.4-0.65) |
| PD-L1 < 1%  | 107 | 12.6 (7-18.5) | 2.8 (2.7-2.8) |
| PD-L1 positive | PEM for measurable disease at baseline | 535 | NR | < 0.001 | NR | NR |
| PD-L1 negative | 106 | NR | NR | NR |
| KEYNOTE-006 [S-[84-86](#_ENREF_84)] | PD-L1 ≥ 1% | PEM 10 mg/kg Q2W | 450 | NR | 0.55 (0.4-0.76) | NR | 0.53 (0.41-0.67) |
| PD-L1 < 1% | 96 | NR | 0.91 (0.49-1.69) | NR | 0.67 (0.41-1.11) |
| PD-L1 ≥ 1%  | PEM 10 mg/kg Q3W | 456 | NR | 0.58 (0.42-0.79) | NR | 0.52 (0.4-0.66) |
| PD-L1 < 1%  | 101 | NR | 1.02 (0.56-1.85) | NR | 0.76 (0.47-1.24) |
| PD-L1 ≥ 1%  | First- or second-line PEM vs. IPI | 671 | NR | 0.56 (0.43-0.74) | NR | 0.52 (0.43-0.64) |
| PD-L1 < 1%  | 150 | NR | 0.94 (0.56-1.6) | NR | 0.83 (0.55-1.26) |
| PD-L1 ≥ 1%  | First-line PEM vs. IPI | 667 | NR | 0.56 (0.43-0.73) | NR | 0.52 (0.43-0.64) |
| PD-L1 < 1% | 150 | NR | 0.95 (0.56-1.62) | NR | 0.83 (0.55-1.26) |

CI = confidence interval; IPI= ipilimumab; NE= not estimable/not reached; NIVO = nivolumab; NR= not reported; HR = hazard ratio; OS = overall survival; PEM= pembrolizumab; PD-L1 = programmed cell death ligand 1; PFS = progression-free survival; Q2W = every 2 weeks; Q3W = every 3 weeks.

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