**Supplemental Table S1.** Univariate association of baseline patient and disease characteristics with survival and response in patients with tumor samples available for analysis of PD-L1 expression (*n* = 459)

|  |  |  |
| --- | --- | --- |
| **Factor** | **Overall survival** | **Response** |
| **Alive at 1 Year,% (95% CI)** | **HR** | ***P***  | **ORR, %** | ***P***  |
| **Traditional factors** |
| ECOG PS |
| 0 | 72 (66.2 to 76.5) | 0.52 | <0.001 | 37 | 0.027 |
| 1 | 48 (39.6 to 55.1) | 26 |
| LDH level |
| Normal | 78 (72.1 to 82.3) | 0.38 | <0.001 | 42 | <0.001 |
| Elevated | 44 (36.2 to 50.5) | 21 |
| M stage |
| M0, M1a, or M1b | 85 (75.8 to 90.4) | 0.42 | <0.001 | 48 | <0.001 |
| M1c | 58 (52.2 to 62.5) | 29 |
| Age |
| Below median(≤61 years)  | 62 (55.0 to 67.9) | 0.95 | 0.679 | 31 | 0.466 |
| Above median (>61 years) | 65 (58.4 to 70.6) | 35 |
| Sex |
| Male | 63 (56.7 to 67.9) | 0.90 | 0.439 | 35 | 0.295 |
| Female | 65 (57.0 to 71.4) | 30 |
| **Other Factors** |
| *BRAF*V600 mutation status |
| Wild type | 65 (59.3 to 69.3) | 0.80 | 0.140 | 35 | 0.093 |
| Mutant  | 60 (49.3 to 68.5)  | 26 |
| Prior brain metastases |
| Yes | 64 (46.1 to 77.2) | 0.83 | 0.445 | 36 | 0.839 |
| No | 63 (58.4 to 67.7) | 33 |
| Prior ipilimumab treatment |
| Naive | 69 (61.8 to 74.6) | 0.84 | 0.172 | 38 | 0.055 |
| Exposed | 59 (52.6 to 64.8) | 29 |
| Number of prior therapies |
| 0 | 73 (63.0 to 80.8) | 0.68 | 0.019 | 44 | 0.010 |
| ≥1 | 61 (55.5 to 65.6) | 30 |
| Pembrolizumab dose and schedule |
| 10 mg/kg Q2W | 65 (56.6 to 72.6) | 0.88 | 0.356 | 38 | 0.335 |
| 10 mg/kg Q3W | 63 (55.8 to 68.6) | 1.01 | 32 |
| 2 mg/kg Q3W | 63 (52.3 to 71.3) |  | 30 |
| BTS (SLD) |
| Below median(≤10.2 cm) | 80 (74.3 to 84.7) | 0.40 | <0.001 | 44 | <0.001 |
| Above median(>10.2 cm) | 47 (40.0 to 53.0) | 22 |
| Tumor PD-L1 status |
| Positive | 69 (63.6 to 73.4) | 0.51 | <0.001 | 39 | <0.001 |
| Negative | 45 (35.4 to 54.4) | 13 |
| Site of metastasis |
| Lung only | 89 (79,94.8) | 0.43 | <0.001 | 61 | <0.001 |
| Liver, with or without any other sites | 53 (44.7,60.9) | 1.45 |  | 20 |  |
| Other | 62 (55.9,68.1) | 1.00 |  | 34 |  |

Abbreviations: BTS, baseline tumor size; CI, confidence interval; ECOG PS, Eastern Cooperative Oncology Group performance status; HR, hazard ratio; LDH, lactate dehydrogenase; ORR, objective response rate; OS, overall survival; PD-L1, programmed death ligand 1; Q2W, every 2 weeks; Q3W, every 3 weeks; SLD, sum of the longest diameters.