**Supplemental Table 1:** MSI-Stable/TMB-Low to -Intermediate patients treated with checkpoint blockade (N = 45)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Patient | Age1 | Sex | Tumor type | TMB | Treatment | Response | PFS2 | OS2 |
| 1 | 45.9 | Female | Glioblastoma | 2 | Nivolumab+Bevacizumab | PD | 1.4 | 4.9 |
| 2 | 63.9 | Female | Ovarian adenocarcinoma | 8 | Nivolumab+olaparib | **PR** | 10.3 | 11.6+ |
| 3 | 43.4 | Male | Melanoma | 9 | Ipilimumab+Nivolumab | PD | 2.2 | 32.6+ |
| 4 | 50.9 | Female | Urothelial carcinoma  | 7 | Atezolizumab | PD | 1.3 | 9.7 |
| 5 | 32.8 | Male | Melanoma | 2 | Ipilimumab | **PR** | 5.4 | 21.5+ |
| 6 | 39.4 | Male | Melanoma | 6 | Ipilimumab+Nivolumab | PD | 4.0 | 7.0 |
| 7 | 63.1 | Female | NSCLC (adenocarcinoma) | 6 | Nivolumab+cabiralizumab | **PR** | 9.3 | 11.3+ |
| 8 | 57.9 | Female | Melanoma | 14 | Ipilimumab+Nivolumab | **SD** | 8.2+ | 8.2+ |
| 9 | 72.3 | Male | Head & neck squamous cell carcinoma | 2 | Pembrolizumab | **PR** | 7.7+ | 12.9 |
| 10 | 58.7 | Male | Melanoma | 17 | Ipilimumab+Nivolumab | **PR** | 4.3 | 18.1+ |
| 11 | 46.2 | Male | Melanoma | 4 | Ipilimumab+Nivolumab+Dabrafenib+Trametinib | **PR** | 16.1 | 16.3 |
| 12 | 66.5 | Male | NSCLC (adenocarcinoma) | 5 | Nivolumab+Bevacizumab | PD | 2.3 | 7.6 |
| 13 | 58.7 | Male | Melanoma | 1 | Ipilimumab+Nivolumab | PD | 2.5 | 8.9+ |
| 14 | 46.6 | Male | Melanoma | 6 | Ipilimumab+Nivolumab+BRAF/MEK | SD | 3.8 | 18.5+ |
| 15 | 59.2 | Male | Head & neck squamous cell carcinoma | 6 | Pembrolizumab | **PR** | 7.3 | 20.7 |
| 16 | 74.1 | Male | Head & neck squamous cell carcinoma | 3 | Pembrolizumab | PD | 1.4 | 2.7 |
| 17 | 65.0 | Female | NSCLC (adenocarcinoma) | 7 | Nivolumab | PD | 1.6 | 1.6 |
| 18 | 78.5 | Male | Head & neck squamous cell carcinoma | 4 | Pembrolizumab | PD | 0.9 | 2.1 |
| 19 | 43.8 | Female | Melanoma | 2 | Pembrolizumab+IDO inhibitor | **SD** | 10.9 | 23.2 |
| 20 | 54.2 | Female | Breast cancer | 5 | Pembrolizumab | **PR** | 11.7 | 11.7+ |
| 21 | 79.0 | Male | Urothelial carcinoma (bladder) | 6 | Atezolizumab | SD | 4.2 | 15.4+ |
| 22 | 70.6 | Male | Melanoma | 4 | Ipilimumab | **SD** | 12.4 | 12.4 |
| 23 | 72.3 | Male | NSCLC (squamous cell carcinoma) | 12 | Nivolumab | SD | 5.8 | 17.4+ |
| 24 | 39.8 | Male | Urethral carcinoma | 10 | Pembrolizumab | SD | 2.8 | 23.0+ |
| 25 | 89.0 | Female | Urothelial carcinoma  | 3 | Atezolizumab | PD | 1.0 | 1.2 |
| 26 | 74.6 | Male | NSCLC (adenocarcinoma) | 3 | Nivolumab | PD | 1.1 | 1.1 |
| 27 | 33.9 | Female | Mesenchymal chondrosarcoma | 6 | Ipilimumab |  SD | 0.7+ | 0.7+ |
| 28 | 73.2 | Male | NSCLC (adenocarcinoma) | 14 | Pembrolizumab | PD | 6.9 | 10.1+ |
| 29 | 79.7 | Female | NSCLC (adenocarcinoma) | 7 | Nivolumab | PD | 1.3 | 9.3 |
| 30 | 58.2 | Male | Pleomorphic cell sarcoma of leg | 8 | Pembrolizumab | PD | 2.7 | 3.4 |
| 31 | 29.7 | Female | Melanoma | 10 | Ipilimumab+Nivolumab | PD | 5.2 | 25.0+ |
| 32 | 60.9 | Male | Head & neck squamous cell carcinoma | 3 | Avelumab+41bb | PD | 1.3 | 13.8 |
| 33 | 58.7 | Male | Head & neck squamous cell carcinoma | 4 | Nivolumab | SD | 5.8 | 18.8 |
| 34 | 55.7 | Male | Maxillary sinus sarcoma | 8 | Nivolumab | **PR** | 19.4+ | 19.4+ |
| 35 | 75.8 | Male | NSCLC (squamous cell carcinoma) and renal cell carcinoma | 4 | Nivolumab | SD | 5.1 | 13.6+ |
| 36 | 76.2 | Male | NSCLC (adenocarcinoma) | 5 | Nivolumab+Erlotinib | PD | 1.7 | 4.9 |
| 37 | 83.3 | Female | NSCLC (adenocarcinoma) | 15 | Nivolumab | **PR** | 3.5 | 3.5 |
| 38 | 56.7 | Male | NSCLC (adenocarcinoma) | 5 | Nivolumab | PD | 1.1 | 10.1+ |
| 39 | 66.5 | Female | NSCLC (adenocarcinoma) | 15 | Pembrolizumab | **PR** | 31.5 | 37.1 |
| 40 | 63.8 | Female | Adrenal cortical carcinoma | 4 | Pembrolizumab | PD | 1.3 | 5.0 |
| 41 | 68.8 | Female | Cervical squamous cell carcinoma | 1 | Pembrolizumab | SD | 4.4 | 5.7+ |
| 42 | 71.1 | Male | NSCLC (adenocarcinoma) | 18 | Nivolumab+Glesatinib | **PR** | 21.5+ | 21.5+ |
| 43 | 79.1 | Female | Head & neck squamous cell carcinoma | 7 | Pembrolizumab | SD | 4.8 | 6.8 |
| 44 | 43.1 | Female | Breast cancer | 14 | Pembrolizumab+Olaparib | **SD** | 6.0 | 12.0 |
| 45 | 41.2 | Male | Melanoma | 16 | Nivolumab | **PR** | 5.6 | 51.7+ |

1At the time of treatment with checkpoint blockade.

2Determined from the start of treatment with checkpoint blockade. “+” means the response is ongoing at the time of data censoring.

**Abbreviations**: IDO = indoleamine 2,3-dioxygenase; NSCLC = non-small cell lung cancer; SD = stable disease; PR = partial response; PD = progressive disease; TMB = tumor mutational burde

**Supplemental Table 2:** MSI-stable TMB high patients treated with checkpoint blockade (N = 45)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Patient | Age1 | Sex | Tumor type | TMB | Treatment | Response | PFS2 | OS2 |
| 1 | 65.9 | Male | Skin squamous cell carcinoma | 347 | Pembrolizumab | PR | 26.8 | 27.0+ |
| 2 | 39.2 | Male | Melanoma | 50 | Ipilimumab+Nivolumab | PD | 1.1 | 27.5+ |
| 3 | 79.4 | Male | Melanoma | 94 | Ipilimumab+Nivolumab | PD | 2.0 | 32.2+ |
| 4 | 57.7 | Male | Basal cell carcinoma | 45 | Nivolumab | PR | 27.4+ | 27.4+ |
| 5 | 55.8 | Female | Breast cancer | 76 | Nivolumab | CR | 12.0+ | 12.0+ |
| 6 | 86.9 | Male | Melanoma | 36 | Pembrolizumab | SD | 2.7 | 6.4 |
| 7 | 72.8 | Female | Urothelial carcinoma  | 25 | Pembrolizumab | PD | 4.1 | 13.9 |
| 8 | 73.5 | Male | Urothelial carcinoma | 20 | Atezolizumab | PD | 1.9 | 5.6 |
| 9 | 70.7 | Female | Melanoma | 105 | Ipilimumab+Nivolumab | SD | 6.3+ | 6.3+ |
| 10 | 80.8 | Male | Melanoma | 104 | Pembrolizumab | CR | 28.1+ | 28.1+ |
| 11 | 32.9 | Male | Glioblastoma | 54 | Nivolumab+Bevacizumab | PR | 6.3 | 8.2+ |
| 12 | 77.6 | Male | Prostate cancer | 36 | Pembrolizumab | SD | 6.2+ | 6.2+ |
| 13 | 66.8 | Male | Melanoma | 32 | Ipilimumab+Nivolumab | PR | 31.3+ | 31.3+ |
| 14 | 69.5 | Female | Esophageal squamous cell carcinoma | 20 | Nivolumab | PR | 6.4 | 17.2 |
| 15 | 79.5 | Male | Skin squamous cell carcinoma | 41 | Pembrolizumab | PR | 27.7+ | 27.7+ |

1At the time of treatment with checkpoint blockade.

2Determined from the start of treatment with checkpoint blockade. “+” means the response is ongoing at the time of data censoring.

**Abbreviations**: CR = complete response; SD = stable disease; PR = partial response; PD = progressive disease; TMB = tumor mutational burden