

Supplemental table S1: Patient demographics

| UPN | Mut | Age | Sex | Race | Primary site | Site of metastases | Stage | Initial LDH | TMB (per Mb) | PDL1 | Brain mets |
|-----|---------------------|-----|-----|------|--------------|--|-------|-------------|--------------|-------|------------|
| 1 | T599 V600insT | 55 | M | C | extr | LN, lung | IVB | 172 | | | yes-d |
| 2 | BRAF-NF2 fusion | 53 | F | C | UNK | LN, adrenal | IVC | 115 | 6 | 6 | yes-d |
| 3 | BRAF deletion | 66 | M | C | extr | bone | IVC | 162 | 5 | 5 | N |
| 4 | CCDC127-BRAF fusion | 64 | M | C | trunk | LN, liver, spleen, bone | IVC | 190 | | | N |
| 5 | exon 8 rearrang | 66 | F | C | scalp | abd, bone | IVC | 187 | 5 | 5 | N |
| 6 | BRAF V600E | 53 | M | C | trunk | LN, SQ, brain | IVD | 286 | 8 | 8 | yes-o |
| 7 | BRAF V600E | 45 | M | C | UNK | brain | IVD | 799 | 13 | 13 | yes-o |
| 8 | BRAF V600E | 59 | F | C | extr | brain, LN, abd | IVD | 394 | 6 | 6 | yes-o |
| 9 | BRAF V600E | 70 | F | C | UNK | brain | IVD | 203 | 5 | 5 | yes-o |
| 10 | BRAF V600K | 52 | F | C | trunk | LN, brain | IVD | 164 | 19 | 19 | yes-o |
| 11 | BRAF V600K | 72 | F | C | trunk | LN, brain | IVD | 226 | 11 | 11 | yes-o |
| 12 | BRAF V600R | 62 | F | C | UNK | LN, brain | IVD | 276 | 11 | 11 | yes-o |
| 13 | BRAF V600E | 34 | M | C | neck | SQ, liver, spleen lung, brain | IVD | 251 | 24 | 24 | yes-o |
| 14 | BRAF V600E | 43 | F | C | trunk | adrenal, lung | IVC | 223 | 6 | 6 | yes-d |
| 15 | BRAF V600E | 26 | M | C | trunk | LN, adrenal, bone | IVC | 216 | 5 | 5 | N |
| 16 | BRAF V600E | 50 | F | C | trunk | LN (unresectable) | IIIB | 161 | 10 | 10 | N |
| 17 | BRAF V600E | 59 | M | C | trunk | lung, bone | IVC | 254 | 3 | 3 | N |
| 18 | BRAF V600E | 48 | F | C | trunk | LN | IVA | 163 | 3 | 3 | N |
| 19 | BRAF V600E | 51 | F | C | extr | LN, lung | IVB | 220 | indet | indet | N |
| 20 | BRAF V600E | 59 | M | C | trunk | LN | IVA | 167 | | | N |
| 21 | BRAF V600E | 48 | M | C | extr | SQ | IVA | 184 | 8 | 8 | N |
| 22 | BRAF V600E | 56 | M | C | trunk | SQ, abd, bone | IVC | 221 | 9 | 9 | N |
| 23 | BRAF V600E | 87 | M | C | trunk | SQ, liver, LN, bone | IVC | 359 | 14 | 14 | N |
| 24 | BRAF V600E | 66 | F | C | extr | LN, SQ | IVA | 196 | 8 | 8 | N |
| 25 | BRAF V600E | 36 | M | C | scalp | LN, SQ | IVA | 171 | 1 | 1 | N |
| 26 | BRAF V600E | 63 | F | C | trunk | mucosal, lung | IVC | 172 | 11 | 11 | N |
| 27 | BRAF V600E | 35 | F | C | trunk | SQ | IVA | 160 | 14 | 14 | N |
| 28 | BRAF V600E | 79 | F | C | extr | SQ, liver | IVC | 189 | 5 | 5 | N |
| 29 | BRAF V600E | 52 | F | C | trunk | LN | IVA | 109 | 78 | 78 | N |
| 30 | BRAF V600E | 68 | F | C | face | SQ, lung | IVB | 184 | | | N |
| 31 | BRAF V600K | 75 | M | C | face | SQ | IVA | 133 | 44 | 44 | N |
| 32 | BRAF V600K | 68 | M | C | trunk | SQ, lung | IVB | 201 | 50 | 50 | N |
| 33 | BRAF V600K | 55 | M | C | ear | SQ, LN | IVA | 189 | 32 | 32 | N |
| 34 | CKIT A829P | 72 | M | C | trunk | SQ, lung | IVB | 163 | >10 | >10 | yes-d |
| 35 | NF1 | 77 | M | C | scalp | lung, liver, bone, brain | IVD | 463 | 82 | 82 | yes-o |
| 36 | NF1 | 67 | M | C | trunk | liver, brain | IVD | 312 | 79 | 79 | yes-o |
| 37 | NF1 | 69 | M | C | UNK | brain, lung SQ | IVD | 236 | n/a | n/a | yes-o |
| 38 | NF1 | 59 | M | C | trunk | lung, bone | IVC | 120 | n/a | n/a | yes-d |
| 39 | NF1 | 48 | M | C | face | lung | IVB | 196 | 139 | 139 | N |
| 40 | NF1 | 83 | M | C | trunk | SQ, lung | IVB | 228 | | | N |
| 41 | NF1 | 84 | M | C | trunk | lung, peritoneal, bone, renal, adrenal, pleura | IVC | 1024 | 61 | 61 | N |
| 42 | NF1 | 100 | F | C | neck | LN, SQ | IVA | 217 | 34 | 34 | N |
| 43 | NF1 | 79 | M | C | UNK | pancreas | IVC | 281 | 106 | 106 | N |
| 44 | NF1 | 75 | M | C | scalp | liver, brain | IVC | 153 | 47 | 47 | N |
| 45 | NF1 | 99 | M | C | scalp | SQ, lung, bone | IVC | 154 | 6 | 6 | N |
| 46 | NF1 | 75 | F | C | UNK | lung | IVB | 364 | 155 | 155 | N |
| 47 | NF1 | 68 | F | C | trunk | LN, SQ | IVA | 297 | 54 | 54 | N |
| 48 | NF1 | 71 | M | C | face | LN, SQ | IVA | 145 | 34 | 34 | N |
| 49 | NF1 | 71 | M | C | scalp | LN | IVA | 154 | 73 | 73 | N |
| 50 | NF1 | 48 | M | C | face | SQ, LN | IVA | 214 | 5 | 5 | N |

| | | | | | | | | | | | |
|----|-----------------|----|---|---|-------|-------------------|-----|-----|-------|-------|-------|
| 51 | NF1 | 53 | F | C | extr | SQ, LN | IVA | 268 | 0 | 0 | N |
| 52 | NF1 | 86 | M | C | scalp | lung | IVB | 176 | 78 | 78 | N |
| 53 | NF1 | 79 | M | C | scalp | SQ | IVA | 215 | 154 | 154 | N |
| 54 | NF1 | 75 | M | C | trunk | bone | IVC | 213 | | | N |
| 55 | NF1 | 81 | M | C | trunk | LN, SQ, lung | IVB | 166 | 52 | 52 | N |
| 56 | NF1 | 77 | M | C | face | SQ | IVA | 269 | 82 | 82 | N |
| 57 | NF1 | 64 | M | C | extr | SQ, lung | IVB | 216 | 49 | 49 | N |
| 58 | NRAS Q61R | 63 | F | C | trunk | LN, liver, lung | IVC | 298 | 11 | 11 | yes-d |
| 59 | NRAS Q61R | 51 | M | C | trunk | SQ | IVA | 127 | 8 | 8 | N |
| 60 | NRAS Q61K | 49 | M | C | extr | SQ | IVA | 191 | 57 | 57 | N |
| 61 | NRAS Q61K | 32 | M | C | UNK | LN, lung | IVB | 239 | 13 | 13 | N |
| 62 | NRAS Q61K | 79 | M | C | UNK | LN | IVA | 499 | 18 | 18 | N |
| 63 | NRAS Q61K | 69 | M | C | trunk | abd | IVC | 180 | 4 | 4 | N |
| 64 | NRAS Q61K | 66 | M | C | trunk | LN, lung | IVB | 154 | 25 | 25 | N |
| 65 | NRAS Q61L | 57 | M | C | UNK | SQ, muscle | IVA | 171 | 32 | 32 | N |
| 66 | NRAS Q61L | 68 | M | C | extr | SQ | IVA | 133 | 39 | 39 | N |
| 67 | NRAS Q61R | 48 | F | C | extr | SQ, renal, lung | IVC | 131 | n/a | n/a | N |
| 68 | NRAS Q61R | 65 | M | C | trunk | LN | IVA | 184 | 15 | 15 | N |
| 69 | NRAS Q61R | 67 | M | C | trunk | LN, pleura | IVB | 205 | 21 | 21 | N |
| 70 | NRAS Q61R | 71 | M | C | UNK | LN, spleen, liver | IVC | 141 | indet | indet | N |
| 71 | NRAS Q61R | 41 | M | C | extr | LN, SQ | IVA | 167 | | | N |
| 72 | NRAS G12D, T50I | 72 | M | C | trunk | LN | IVA | 171 | 81 | 81 | N |
| 73 | QN | 70 | M | C | scalp | lung | IVB | 305 | 88 | 88 | N |
| 74 | QN | 56 | M | H | extr | liver, bone | IVC | 187 | 2 | 2 | N |
| 75 | QN | 63 | M | C | scalp | lung, LN | IVB | 191 | 16 | 16 | N |
| 76 | QN | 63 | M | C | trunk | LN, ascites | IVC | 160 | 4 | 4 | N |
| 77 | QN | 75 | F | C | extr | LN, SQ | IVA | 202 | 24 | 24 | N |
| 78 | QN | 57 | M | C | extr | LN, bone | IVC | 286 | 11 | 11 | N |
| 79 | QN | 60 | M | C | trunk | lung | IVB | 193 | indet | indet | N |
| 80 | QN | 42 | M | C | extr | LN,SQ | IVA | NA | 1 | 1 | N |
| 81 | QN | 51 | F | C | trunk | LN | IVA | 293 | 9 | 9 | N |
| 82 | QN | 76 | F | A | extr | LN | IVA | 181 | 1 | 1 | N |
| 83 | QN | 80 | M | C | extr | lung, LN | IVB | 142 | | | N |
| 84 | QN | 76 | F | C | neck | lung | IVB | 181 | | | N |
| 85 | QN | 44 | M | C | ear | LN, liver, lung | IVC | 240 | 19 | 19 | N |

UPN, unique patient number; QN, "quadruple negative" (no BRAF, NRAS, CKIT or NF1 mutations identified); F, female; M, male; C, Caucasian; H, Hispanic; A, Asian; extr, extremity; UNK, unknown primary; SQ, subcutaneous; LN, lymph node; abd, abdomen; yes-d; delayed onset of brain metastases; yes-o, brain metastases at diagnosis of metastatic disease; N, no brain metastases.