**Table S1**

|  |  |  |  |
| --- | --- | --- | --- |
| **Phenotype** | **Experiment name** | **Variables** | **n** |
| **Wild-type** | **CyTOF\_ex\_04122018****CyTOF\_ex\_05232018** | **Isotype-Control vs. anti-PD-1****Isotype-Control vs. anti-PD-1, SD-101, anti-PD-1+SD-101,** **Bempegaldesleukin** | **6****21** |
| ***JAK1*-KO** | **CyTOF\_ex\_02282018****CyTOF\_ex\_Jul18****CyTOF\_ex\_10032018** | **Isotype-Control vs. anti-PD-1****Isotype-Control vs. anti-PD-1****Isotype-Control vs. anti-PD-1, SD-101, anti-PD-1+SD-101** | **4****6****18** |
| ***JAK2*-KO** | **CyTOF\_ex\_02282018****CyTOF\_ex\_Jul18****CyTOF\_ex\_03192019** | **Isotype-Control vs. anti-PD-1****Isotype-Control vs. anti-PD-1****Isotype-Control vs anti-PD-1, SD-101, anti-PD-1+SD-101** | **6****6****22** |
| ***B2M*-KO** | **CyTOF\_ex\_04122018****CyTOF\_ex\_Jul18****CyTOF\_ex\_02122019** | **Isotype-Control vs. anti-PD-1****Isotype-Control vs. anti-PD-1****Isotype-Control vs. bempegaldesleukin, anti-PD-1+bempegaldesleukin** | **6****6****14** |

**Table S1:** A summary of seven studies included in the meta-analysis.

**Table S2**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tag** | **Target** | **Clone** | **Source** |
| 191/3 lr | DNA-single cells | - | Fluidigm |
| Cisplatin | Dead cells | - | Fluidigm |
| 89Y | CD45 | 30-F11 | DVS |
| 142Nd | CD11c | N418 | DVS |
| 143Nd | CD69 | H1.2F3 | DVS |
| 146Nd | F4/80 | BM8 | DVS |
| 148Nd | CD11b | M1/70 | DVS |
| 149Nd | CD62L (L-selectin) | MEL-14 | Biolegend |
| 150Nd | Ly6C | Hk1.4 | DVS |
| 151Eu | Ly6G | 1A8 | DVS |
| 152Sm | CD3e | 145-2C11 | DVS |
| 153Eu | CD274 PD-L1 | 10F.9G2 | FDM |
| 155Gd | CD25 (IL-2R) | 3C7 | Biolegend |
| 159Tb | CD279 PD1 | 29F.1A12 | DVS |
| 162Dy | CD366 (TIM3) | RMT3-23 | DVS |
| 166Er | CD19 | 6D5 | DVS |
| 167Er | CD335 (Nkp46) | 29A1.4 | DVS |
| 168Er | CD8a | 53-6.7 | DVS |
| 170Er | CD161 (NK1.1) | PK136 | DVS |
| 171Yb | CD44 | IM7 | DVS |
| 172Yb | CD4 | RM4-5 | DVS |
| 174Yb | I-A/I-E (MHC class II) | M5/114.15.2 | DVS |
| 175Lu | CD103 | 2E7 | Biolegend |
| 176Yb | CD45R\_B220 | RA3-6B2 | DVS |
|  | **Intracellular** |   |   |
| 115IN | Ki67 | SolA15 | ThermoScientific |
| 141Pr | TNF alpha | MP6-XT22 | DVS |
| 147Sm | Eomes | Dan11mag | ThermoScientific |
| 158Gd | FoxP3 | FJK-16s | DVS |
| 161Dy | T-bet | B56 | DVS |

**Table S2:** List of antibodies used for CyTOF.

**Table S3**

|  |  |
| --- | --- |
| Name | Cell Definitions |
| Myeloid | CD3-CD19-CD161- |
| T\_cells | CD3+CD11b-CD19-CD45R\_B220-CD16-CD335- |
| B\_cells | CD3-CD11b-CD19+CD45R\_B220+ |
| NK\_cells | CD3-CD11b-CD19-CD161+CD335+ |
| NK\_cells | CD3-CD11b-CD19-CD16-+CD335+ |
| NK\_cells | CD3-CD11b-CD19-CD161+CD335- |
| Macrophague | CD3-CD19-CD161-CD335-CD11b+F4/80+ |
| Macrophague-M1 | CD3-CD19-CD161-CD335-CD11b+F4/80+MCH\_II\_IA\_IE+ |
| Macrophague-M2 | CD3-CD19-CD161-CD335-CD11b+F4/80+MCH\_II\_IA\_IE- |
| Macrophague-inflamation | CD3-CD19-CD161-CD335-CD11b+F4/80+CD11c+MCH\_II\_IA\_IE+/- |
| DCs | CD3-CD19-CD161-CD335-CD11b+CD11c+ |
| rDCs | CD3-CD19-CD161-CD335-CD11b+CD11c+MCH\_II\_IA\_IE+ |
| CD11b+rDCs | CD3-CD19-CD161-CD335-CD11b+CD11c+MCH\_II\_IA\_IE+CD8alfa- |
| mDCs | CD3-CD19-CD161-CD335-CD11b+CD11c+MCH\_II\_IA\_IE++ |
| CD103+mDCs | CD3-CD19-CD161-CD335-CD11b+CD11c+MCH\_II\_IA\_IE++CD103+ |
| G-MDSC | CD3-CD19-CD161-CD335-CD11b+F4/80-Ly6G+Ly6C- |
| MDSC | CD3-CD19-CD161-CD335-CD11b+F4/80-Ly6G-Ly6C+ |
| naïve\_CD4\_T\_cells | CD3+CD11b-CD19-CD45R\_B220-CD16-CD335-CD4+CD62L+CD44- |
| naïve\_CD8\_T\_cells | CD3+CD11b-CD19-CD45R\_B220-CD16-CD335-CD8+CD62L+CD44- |
| Eff\_CD4\_Tcells | CD3+CD11b-CD19-CD45R\_B220-CD16-CD335-CD4+CD62L-CD44- |
| Eff\_CD8\_Tcells | CD3+CD11b-CD19-CD45R\_B220-CD16-CD335-CD8+CD62L-CD44- |
| Tregs | CD3+CD11b-CD19-CD45R\_B220-CD16-CD335-CD4+CD25+FoxP3+ |

**Table S3:** Cell definitions used to identify the 26 cell populations in the meta-analysis.

**Table S4**

**Human melanoma cell lines**

|  |  |
| --- | --- |
| **Gene** | **sgRNA** |
| ***JAK1*** | sgRNA1 FW 5-CATCCGGTAGTGGAGCCGGA-3 |
|  |  sgRNA1 RV 5-TCCGGCTCCACTACCGGATG-3 |
|  | sgRNA2 FW 5-TCTCGTCATACAGGGCAAAG-3 |
|  | sgRNA2 RV 5-CTTTGCCCTGTATGACGAGA-3 |
| ***JAK2*** | sgRNA1 FW 5-ATCTGCCTCAGATTTCCCAA-3 |
|  | sgRNA1 RV 5-TTGGGAAATCTGAGGCAGAT-3 |
|  | sgRNA2 FW 5-CTTACGATGACAGAAATGGA-3 |
|  | sgRNA2 RV 5-TCCATTTCTGTCATCGTAAG-3 |
| ***B2M*** | sgRNA2 FW 5-ATACTCATCTTTTTCAGTGG-3 |
|  | sgRNA2 RV 5-CCACTGAAAAAGATGAGTAT-3 |
|  | sgRNA3 FW 5-GAGTAGCGCGAGCACAGCTA-3 |
|  | sgRNA3 RV 5-TAGCTGTGCTCGCGCTACTC-3 |

**Murine cell lines**

**MC38**

|  |  |
| --- | --- |
| **Gene** | **sgRNA** |
| ***JAK1*** |  sgRNA1 FW 5-CAGCGGAGAGTATACAGCCG-3 |
|  |  sgRNA1 RV 5-CGGCTGTATACTCTCCGCTG-3 |
|  | sgRNA2 FW 5-CATTTTAGCACAGAACGCCA-3 |
|  | sgRNA2 RV 5-TGGCGTTCTGTGCTAAAATG-3 |
|  | sgRNA3 FW 5-CTGGACAACCGAATAAATGC-3 |
|  |  sgRNA3 RV 5- GCATTTATTCGGTTGTCCAG-3 |
| ***JAK2*** |  sgRNA1 FW 5-ATATCACCATTCTGATGTAC-3 |
|  | sgRNA1 RV 5-GTACATCAGAATGGTGATATC-3 |
|  | sgRNA2 FW 5- CATCAGAATGGTGATATTCC-3 |
|  |  sgRNA2 RV 5- GGAATATCACCATTCTGATG-3 |
| ***B2M*** | sgRNA1 FW 5-CTGGTGCTTGTCTCACTGAC-3 |
|  | sgRNA1 RV 5-GTCAGTGAGACAAGCACCAGC-3 |
|  | sgRNA2 FW 5-TCACGCCACCCACCGGAGAA-3 |
|  | sgRNA2 RV 5-TTCTCCGGTGGGTGGCGTGAC-3 |

**B16**

|  |  |
| --- | --- |
| **Reagent** | **Sequence(s)** |
| ***JAK1* CRISPR guide** | CAGCGGAGAGTATACAGCCG |
| ***JAK2* CRISPR guide** | CATCAGAATGGTGATATTCC |
| ***B2M* CRISPR guide** | TCACGCCACCCACCGGAGAA |

**Table S4:** List of CRISPR sgRNA sequences