Supplemental Figure Legends S1-S6

Figure S1. Immunoblotting of LKB1 in **A**) HBEC parental cell lines with transient LKB1 knockdown, **B**) H441 cancer cells transduced with NS or shLKB1 lenti-virus **C**) H1838 and H1793 cancer cells transfected with sictrl or siLKB1, **D**) and indicated isogenic H838 cancer cell lines. **E**) The expression of *CXCL10* was determined in isogenic H838 cell lines by q-PCR.

Figure S2. **A**) Representative images of H&E staining of lung tumors from KL and KP GEMMs at week 4 (4w) post tumor induction. **B**) Immunoblotting of LKB1 in multiple murine syngeneic KPL and KP cell lines. **C**) Tumor weights of KP and KL GEMMs of NSCLC. **D**) The abundance of M-MDSCs in lung tumors of KP and KL mice was determined by flow cytometry. M-MDSC is defined as $MHCII^{lo}CD11b^{+}Ly6C^{hi}Ly6G^{-}$. **E**) Weights of subcutaneous KPL and KP tumors. **F**) Percentage $CXCR2^{+}$G-MDSCs in the blood (day 9) and the spleen (day 15) of mice bearing subcutaneous KPL and KP tumors. [1940A ($1x10^5$), 1950A ($3x10^5$), 1969B ($1x10^6$), 2042 ($1.5x10^6$) cells in FBV mice]. **G**) CXCL1 concentration in the blood of mice bearing KPL and KP tumors as in **F** on day 15 was evaluated by ELISA. * $P<0.05$; **, $P< 0.01$; ***, $P< 0.001$; ****, $P< 0.0001$.

Figure S3. **A**) After subcutaneous inoculation of FVB mice with $1.0x10^5$ KPL-P cells, anti-Gr-1 (green box) treatment was started on day 5, and anti-PD-1 (blue box) therapy on day 7. Further doses were given as illustrated. Growth curves and corresponding tumor weights at the time of euthanasia are presented. Results are representative of at least three biological replicates of 6-10 mice per group. **B**) The expression of the indicated ELR+ CXC chemokines was determined in

KPL-P and KPL-3M cell lines by q-PCR. **C**) Weight of KPL-3M tumors at the time of euthanized for immunophenotyping following anti-Gr-1 and anti-PD-1 therapy. * $P<0.05$; ***, $P<0.001$.

Figure S4. *In vitro* proliferation of KPL-3M cells treated with ATRA as indicated.

Figure S5. **A**) Weight of KPL-3M tumors at the time of euthanasia for immunophenotyping following the ATRA and anti-PD-1 regimen. **B**) The gating strategy of the myeloid sub-populations for immunophenotyping. **C**) The abundance of M-MDCS, TAM, cDC1, cDC2 and inf DC in the TME of KPL-3M tumors following ATRA and anti-PD-1 treatments. **D**) PD-L1 MFI in PD-L1$^+$ G-MDSCs, M-MDSCs, TAMs, cDCs and inf DCs. **E**) PD-L1 expression in tumor cells normalized to isotype control. **F**) CellTrace Violet dilution of murine T cells isolated from naïve spleens and stimulated with IL-2 and αCD3/αCD28 beads. Tumor-infiltrating G-MDSCs from KPL-3M tumor-bearing mice were flow-sorted and treated with vehicle or ATRA *in vitro* for 24 hours and subsequently co-cultured with T cells. Flow histograms and quantification of T cell proliferation are presented. **G**) *In vitro* proliferation of G-MDSCs treated with ATRA as indicated. * $P<0.05$; **, $P< 0.01$; ***, $P<0.001$; ****, $P< 0.0001$.

Figure S6. The same immunophenotyping of spleen as in **Fig. 7**. **A)** Relative abundance of macrophages in the spleen. **B)** Relative abundance of FOXP3$^-$CD4, CD8 and Treg in the spleen. **C**) Percentage of Ki-67$^+$ cells in PD-1$^+$ CD4 EM T cells in the spleen. **D**) Percentage of Ki-67$^+$ cells in PD-1$^+$ CD8 EM T cells in the spleen. **E**) IFNγ secretion in NK cells in spleen. Treatment is indicated at the bottom of each graph. * $P<0.05$; ****, $P< 0.0001$.