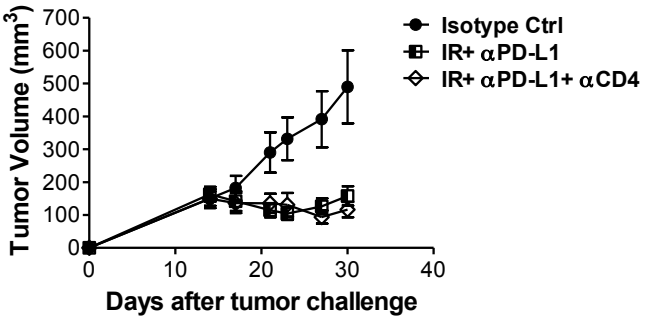
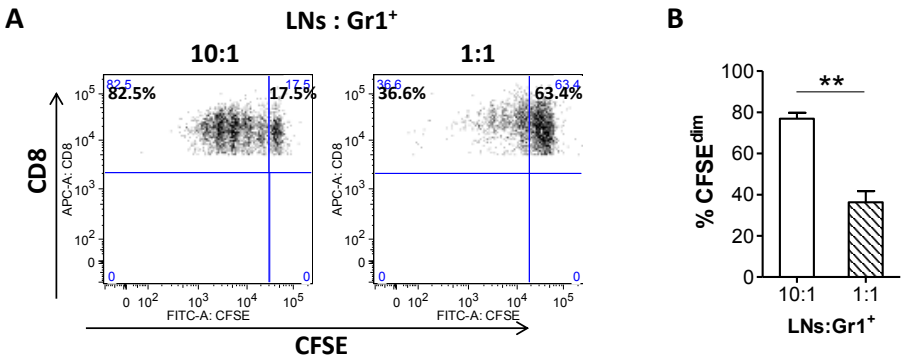


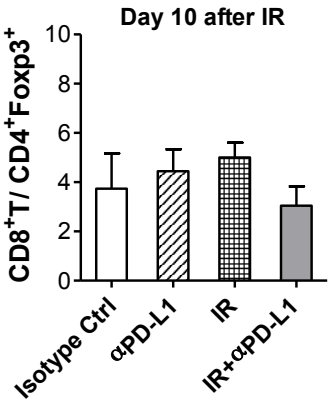
Supplementary Figure 1

$CD4^+$ T cells are dispensable for the efficacy of combination of IR and anti-PD-L1. Tumors received 12 Gy and mice were treated with anti-PD-L1 as described in Figure 2(**A**). Starting from one day prior to IR, 250μg depletion antibody of $CD4^+$ T cells (clone GK1.5) was injected intraperitoneally every three days for a total four times. Representative data from two experiments conducted with 6-8 mice/group are shown.



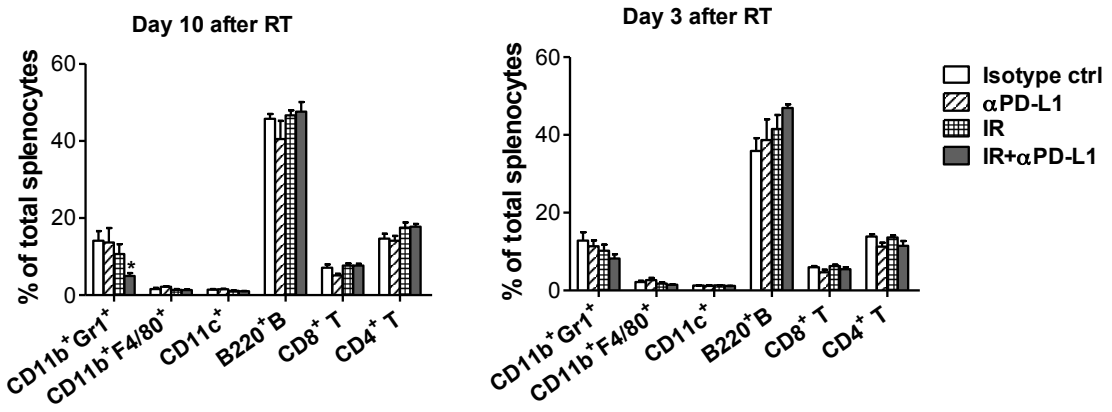
Supplementary Figure 2

MDSCs inhibit the proliferation of $CD8^+$ T cells. $Gr1^+$ cells were purified from the spleen of three TUBO-bearing mice. Lymph nodes were obtained from naïve mice and then labeled with 5μM CFSE. Lymph node cells were stimulated with coated 10μg/ml anti-CD3 and 2μg/ml anti-CD28 in the presence of $Gr1^+$ cells at a ratio of 10:1 or 1:1 in triplicate. Three days later, the cells were harvest and subjected to staining. **P<0.01. Representative data (**A**) and quantitative data (**B**) from two experiments conducted are shown.



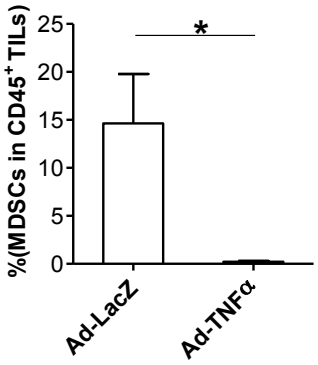
Supplementary Figure 3

The ratio of $CD8^+$ T/Treg is unaffected by IR and PD-L1 blockade. Tumors received 12 Gy and mice were treated with anti-PD-L1 as described in Figure 2(**A**). Ten days later after IR, tumors were removed to obtain cell suspensions for surface and intracellular staining. Flow cytometry analysis of Treg ($CD4^+Foxp3^+$) and $CD8^+$ T was gated on $CD45^+$ cells. Representative data from two experiments conducted with 4-5 mice/group are shown.



Supplementary Figure 4

Quantitative data of the percentage of immune cell populations relative to total splenocytes on day 10 (*left*) and on day 3 (*right*) after IR. Mice were treated as described in Figure 2(**A**). Three days or ten days after IR, spleens were removed to obtain cell suspensions for surface staining of MDSCs ($CD11b^+Gr1^+$), macrophages ($CD11b^+F4/80^+$), dendritic cells ($CD11c^+$), B cells($B220^+$), $CD8^+$ T cells and $CD4^+$ T cells. *P<0.05. Representative data from two experiments conducted with 4 mice/group are shown.



Supplementary Figure 5

TNF-α promotes the reduction of MDSCs in vivo. Tumors were allowed to grow for 14 days. The recombinant Ad-TNF-α ($1.5x10^{10}$ VP) was infected intratumorally. $1.5x10^{10}$ VP Ad-LacZ was used as negative control. Three days after adenovirus treatment, the tumors were harvested and processed for flow cytometry assay. *P<0.05. Representative data from two experiments conducted with 4 mice/group are shown.