**Supplementary Figure 1: Murine ID8 EOC models.** A) Gross observations of the IP model at end stage. Picture 1.) Ascites bloats the peritoneal cavity. Picture 2.) The ascites is hemorrhagic. Picture 3.) Tumor nodules can be seen attached to the peritoneal wall (yellow circles). Picture 4.) Nodules, circled in yellow, are spread throughout peritoneal wall and cavity. B) Gross observations of the orthotopic model. Picture 1.) Bioluminescent signal becomes visible around week 12 post-implantation. Picture 2.) By week 14, metastases throughout the abdomen were seen, which is confirmed by *in situ* bioluminescent imaging (Picture 3). Picture 4 is the gross image of orthotopic primary tumor *in situ.* Briefly, the method to establish the intraovarian, orthotopic model is as the following: A small incision was made through the skin and peritoneal wall on the lower-middle back of C57BL/6 female mice. The left ovary was exposed under a dissecting microscope and a Hamilton syringe was used to place 1 x 106 ID8 cells under the ovarian bursa. C) An accumulation of MDSCs (CD45+ CD11b+ Gr-1+) is found in the peripheral blood (n=3-4). D) Splenomegaly is consistently seen in the late stages of ID8 cancer. E) During the progression of IP ID8 cancer, flow cytometry shows an accumulation of macrophages (CD45+ F4/80+) in the area that becomes the “primary” tumor. Imaging and longitudinal analysis shows that the “primary” tumor in the IP. ID8 model grows in the pancreas, so if tumors were not yet present we took the pancreas for this analysis (n=3-4). F) Results of Miles assay on naïve and tumor-bearing mice. Pictures below show the visible increase of accumulated blue dye in tissues in the peritoneum of the tumor-bearing mouse *in situ* and *ex vivo* mesentery, in comparison to the naïve animal. G) Density of mesentery lymphatic vessels. H) Diaphragm immunofluorescence stain showing lymphatic vessel (LYVE1, red) and DAPI stains. Arrows point out representative vessels. Staining method was performed as previously reported (25). LYVE1 antibody was purchased from Reliatech. Scale bars represent 100um. \*p<0.05

**Supplementary Figure 2: CSF1R and CSF-1 in ovarian cancer cells.** A) RT-PCR showing negligible CSF1R expression in ID8 cells and three human EOC cells lines as compared to positive control RAW macrophages. B) RT-PCR showing all EOC cell lines express CSF-1. C) Proliferation assay showing that having functional CSF1R makes RAW macrophages sensitive to both CSF-1 and GW2580 (n=4). D) GW2580 does not significantly alter CSF1R negative ID8 cell proliferation. E) Subcutaneous ID8 tumor weight after two weeks of diluent or GW2580 treatment (n=3). F) Histology of gastrointestinal tract, kidney, liver, and pancreas of naïve, control, and GW2580-treated mice with IP tumors.

The RT-PCR method is as following. RNA isolation was performed according to the TRIzol procedure and quantified/assessed for purity (all 260/280 readings were above 1.9) by UV spectrophotometry. 1 μg RNA was reverse-transcribed using the iScript cDNA synthesis kit (Biorad). For each sample, 1 μl cDNA was amplified using Cyber green 2× master mix (Bioline). Primers were used at a final concentration of 400nM. The reaction was run on My IQ single color iCycler real time PCR machine (Biorad)using the following cycling conditions: 40 cycles of 95°C/15 sec, 60°C/30 sec and 72°C/30 sec. Gene expression was determined by ΔCt and normalized to β-actin expression. \*p<0.05, \*\*\*p<0.001

**Supplementary Figure 3: Systemic effects of GW2580 treatment.** A) With GW2580 treatment, the absolute numbers of total ascites T cells do not change, while the absolute number of CD4+ T cells decreases and the absolute number of CD8+ T cells increases (n=2-3). B) Interferon gamma expression in ascites macrophages (n=3). C) IL-12 expression in ascites macrophages (n=3). D) Density of mesentery lymphatic vessels changed with GW2580 treatment. E) Immunofluorescence stain of diaphragm showing lymphatic vessel (LYVE1, red) and nuclei (DAPI). Arrows point out representative vessels. F) No change seen in muscle compartment with Evans Blue extravasation. G) VEGF ELISA performed on ascites (R&D Systems, Catalog# MMV00) H) Circulating MDSC levels are high during late-stage ID8 ovarian cancer, but they are reduced by CSF1R inhibition (n=3- 4). I) CSF1R inhibition lessens splenomegaly. J and K) Macrophages (CD45+ F4/80+) are elevated in the lymph nodes and spleen in late-stage ID8 cancer (data not shown), but are significantly reduced with CSF1R inhibition (n=4). L) CSF1R blockade reduced macrophage infiltration in tumors of GW2580-treated animals when compared to vehicle-treated animals. (n=4). M and N) The polarization of OVCAR3 TAMs as assessed by CD45+, F4/80+, and MHCII+ (M1) and CD45+, F4/80+, MHCII- (M2). O) Number of OVCAR3 TAMs per mg tumor, with polarization assessed in L and M. Scale bars represent 100um.

**Supplementary Figure 4: Tumor growth and spread is reduced with CSF1R inhibition.** A) Control ID8-bearing mice have widespread disseminated metastasis, while GW-treated mice have fewer visible nodules. B) This lessened tumor burden in the ID8 model is confirmed by *in situ* bioluminescent imaging. C) This trend of decreasing tumor burden in the ID8 model is quantified to the right from one study (n=4). D) Decreased tumor burden is also observed in the OVCAR3 model (n=2- 4).

**Supplementary Figure 5: ID8 model ascites is similar to EOC patient ascites.** H&E staining of ascites smears from ID8 tumor-bearing control mice and an EOC patient.