Supporting Information

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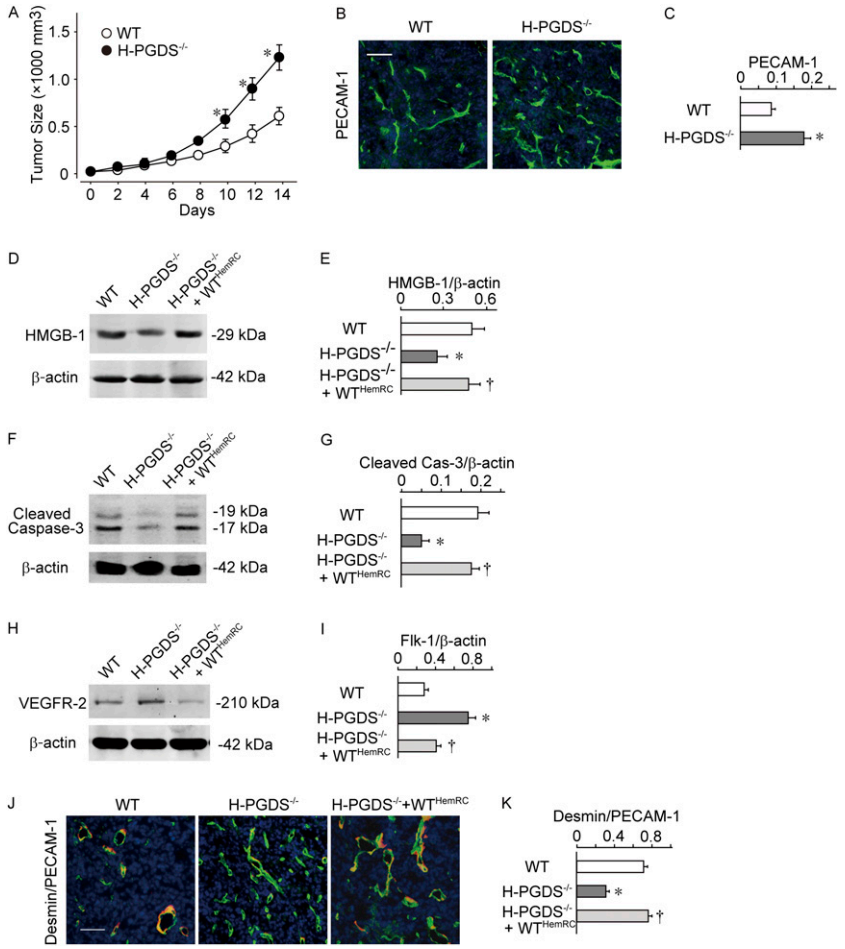

Fig. S1. (*A*–C) Host hematopoietic prostaglandin D_2 (PGD_2) synthase (H-PGDS) deficiency accelerates tumor growth and angiogenesis in B16 melanoma. Melanoma cells (1×10^6) were injected subcutaneously on the backs of mice, and tumor growth was monitored (*A*, $n = 8$ each). Tumor sections (day 14) were labeled with anti–PECAM-1 (platelet endothelial cell adhesion molecule) antibody (*B*) and the labeled area was quantified relative to total pixel density (*C*, $n = 8$ each). (Scale bar in *B*, 50 μm.) (*D*–*I*) Absence of bone marrow-derived PGD_2 decreases necrotic/apoptotic cell death, and increases angiogenesis in growing Lewis lung carcinoma (LLC) tumor. Cytoplasmic proteins extracted from tumor mass (day 14) were applied for Western blot to detect the high mobility group box 1 (HMGB-1) protein leakage from nuclei. Total protein extracts were applied to detect cleaved caspase-3 or an endothelial marker, VEGFR-2. Band intensities were normalized and shown as the ratio of β-actin ($n = 5$ each). Anti–HMGB-1, cleaved caspase-3 (Cell Signaling), VEGFR-2 (R&D Systems), and β-actin (Sigma-Aldrich) antibodies were used. (*J* and *K*) Host H-PGDS deficiency decreases pericyte-coverage in the tumor-neovasculature. Tumor sections were labeled with antidesmin antibody (Abcam) and anti–PECAM-1 antibody (*J*) (Scale bar, 50 μm). The pixel density of desmin was normalized to total PECAM-1^+ pixel density (*K*, $n = 5$ each). Results are expressed as means ± SEM. $*^{\dagger}P < 0.05$ compared with WT or H-PGDS$^{-/-}$, respectively.

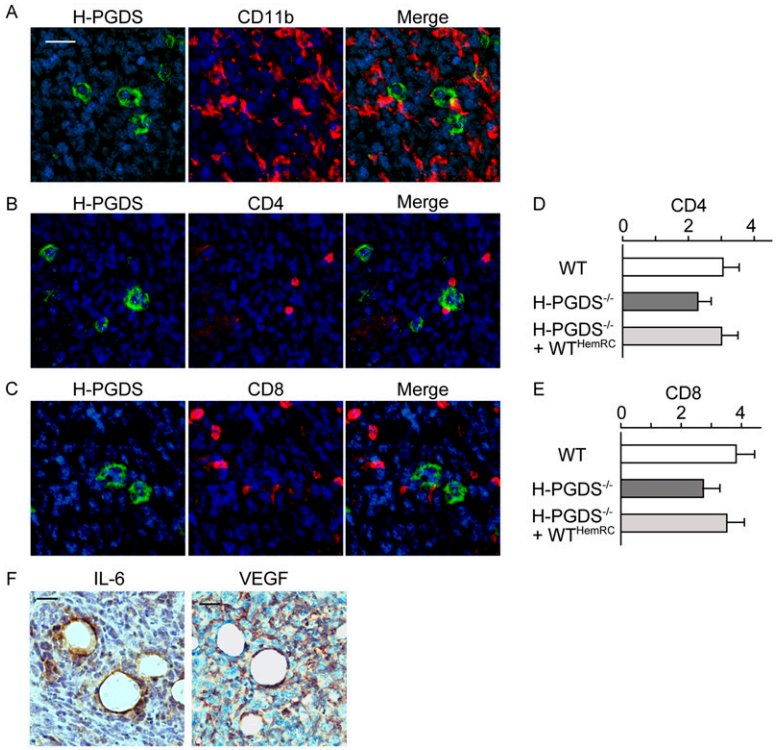

Fig. S2. (*A–E*) Infiltrating CD11b$^+$, CD4$^+$, or CD8$^+$ cells do not express H-PGDS in tumors. Sections were subjected to double immunostaining for H-PGDS and CD11b (*A*) , H-PGDS and CD4 (*B*), or H-PGDS and CD8 (*C*). (Scale bar in A, 50 μm.) Their numbers were normalized to field area (*D* and *E*, results are expressed as means ± SEM, $n = 6$ each). (*F*) Expression of IL-6 or VEGF in tumor. Paraffin-embedded sections of tumor on WT mice were labeled with anti–IL-6 (Santa Cruz) or anti-VEGF (Sigma-Aldrich) antibodies (Scale bars, 50 μm).

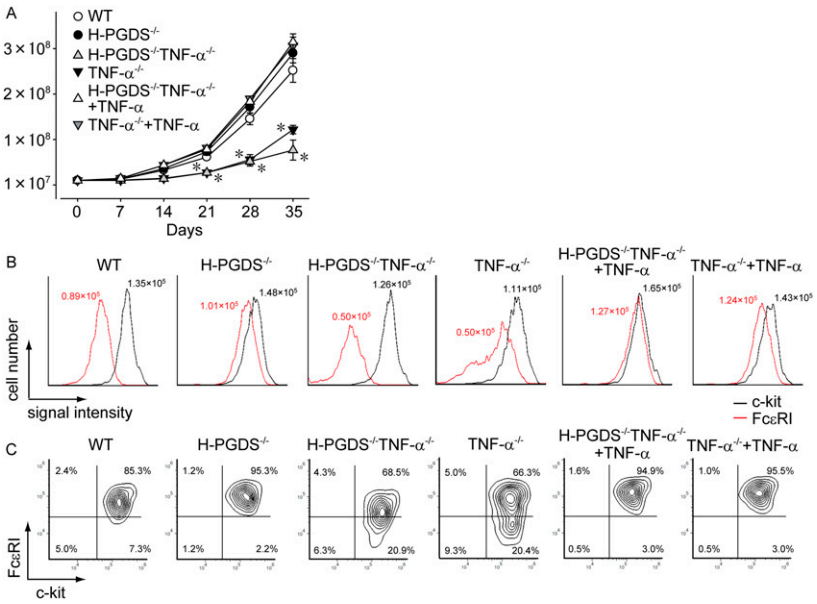

Fig. S3. TNF-α but not PGD_2 is required for IL-3–mediated bone marrow-derived mast cell (BMMC) differentiation and maturation. (*A*) Isolated bone marrow cells were cultured with 5 ng/mL IL-3 and cell numbers were monitored at each time point. In some experiments, 1 ng/mL TNF-α was additionally added ($n = 5$ each; $*^{\dagger}P < 0.05$ compared with WT, H-PGDS$^{-/-}$TNF-α$^{-/-}$, or TNF-α$^{-/-}$). (*B* and *C*) Cell-surface expressions of FcεR1 and c-kit were analyzed by FACS. Representative data from four independent experiments are shown.

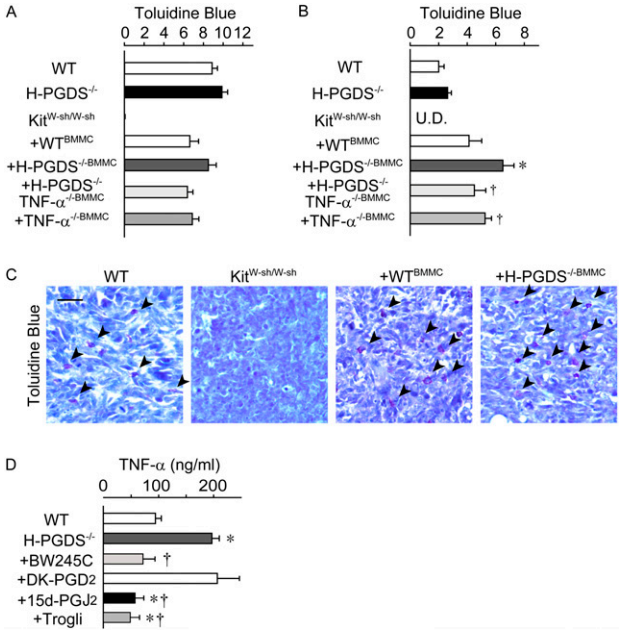

Fig. S4. (*A* and *B*) Mast cell reconstitution in back skin and lung on $Kit^{W\text{-}sh/W\text{-}sh}$ mice. BMMCs were transferred by intradermal and by tail-vein injection into $Kit^{W\text{-}sh/W\text{-}sh}$ mice. Eight weeks after the injection, tissues were dissected and subjected to Toluidine blue staining. The number of metachromatically stained cells were normalized to field area (*A* and *B*, results are expressed as means ± SEM, $n = 4$; $*^{\dagger}P < 0.05$ compared with WT^{BMMC}-reconstituted $Kit^{W\text{-}sh/W\text{-}sh}$ mice or H-$PGDS^{-/-BMMC}$-reconstituted mice, respectively). (*C*) Mast cell reconstitution in tumor on $Kit^{W\text{-}sh/W\text{-}sh}$ mice. BMMCs were transferred into $Kit^{W\text{-}sh/W\text{-}sh}$ mice as mentioned above. Additionally, after LLC transplantation, BMMCs were injected by tail vein every 5 d. Fourteen days after the LLC transplantation, tumors were excised, and processed for Toluidine blue staining (Scale bar, 50 μm). (*D*) H-PGDS deficiency accelerates and D prostanoid agonism or PGJ_2 attenuates TNF-α production of BMMC. BW245C (100 nM), DK-PGD_2 (100 nM), 15d-PGJ_2 (15-deoxy-^{12,14}-PGJ_2; 30 nM), or Troglitazone (300 nM) was treated 10 min before the LPS-stimulation. Twenty-four hours after stimulation with 10 ng/mL LPS, supernatants of BMMC culture were collected and applied to ELISA. Results are expressed as means ± SEM, $n = 4$–8, $*^{\dagger}P < 0.05$ compared with WT or H-$PGDS^{-/-}$, respectively.

Table S1. Primer lists

Name		Sequences
VEGF-A	Sense	TGCACCCACGACAGAAGGA
	Antisense	GTCCACCAGGGTCTCAATCG
bFGF	Sense	GGCTGCTGGCTTCTAAGTGT
	Antisense	TATGGCCTTCTGTCCAGGTC
EGF	Sense	CCCAGGCAACGTATCAAAGT
	Antisense	GGTCATACCCAGGAAAGCAA
Angiopoetin-1	Sense	CCATGCTTGAGATAGGAACCAG
	Antisense	TTCAAGTCGGGATGTTTGATTT
TNF-α	Sense	ACGGCATGGATCTCAAAGAC
	Antisense	CGGACTCCGCAAAGTCTAAG
IL-1β	Sense	AGCTCTCCACCTCAATGGAC
	Antisense	GACAGGCTTGTGCTCTGCTT
IL-6	Sense	TCTCTGGGAAATCGTGGAAA
	Antisense	GATGGTCTTGGTCCTTAGCC
MCP-1	Sense	AATGCTAACGCCACCGAGAG
	Antisense	CCTTGTTCTGCTCCTCATAGTCC
GM-SCF	Sense	TGGTCTACAGCCTCTCAGCA
	Antisense	ATGAAATCCGCATAGGTGGT
TGF-β	Sense	TAGGAAGGACCTGGGTTGGAAG
	Antisense	CGGGTTGTGTTGGTTGTAGAGG
MMP-2	Sense	GACATACATCTTTGCAGGAGACAAG
	Antisense	TCTGCGATGAGCTTAGGGAAA
MMP-9	Sense	AGAAGCAGTCTCTACGGCCG
	Antisense	TGATGGTCCCACTTGAGGCC
COX-2	Sense	TTTGGTCTGGTGCCTGGTC
	Antisense	CTGCTGGTTTGGAATAGTTGCTC
mPGES-1	Sense	ATGAGGCTGCGGAAGAAGG
	Antisense	ATGAGGCTGCGGAAGAAGG
GAPDH	Sense	CCCTGTTGCTGTAGCCGTAT
	Antisense	TGTTCCTACCCCCAATGTGT

MMP, matrix metallopeptidase; mPGES, microsomal PGE_2 synthase.