**Suppl Fig 1: I-BET 762 inhibits proliferation and induces G1 phase cell cycle arrest in MDA-MB-231 breast cancer cells.** MDA-MB-231 cells were plated in 96 well plates (2500 cells/well). The following day, cells with treated with various concentrations of I-BET 762 for 72 hours and evaluated using an MTT assay (A). Cells were incubated with 3-[4,5-dimethylthiazol-2-yl]-2,5- diphenyltetrazolium bromide; thiazolyl blue; Sigma-Aldrich) for 2 h. Developing solution (0.04 N HCl in isopropanol) was used to lyse cells, and pates were read at 630-570 nm. In (B), MDA-MB-231 cells were synchronized for 24 hours in DMEM media with 1% FBS. After synchronization, cells were treated with 1-3 µM I-BET 762 for 48-72 hours. Cells were fixed in 70% ethanol overnight and incubated with 0.1 mg/ml RNase and 50 µg/ml propidium iodide at 37∘C for 30 minutes. Histograms from the analysis of the flow cytometry show the percentage of cells in each phase of the cell cycle.

**Suppl Fig 2: Effects of I-BET 762 on immune cells in PyMT mice after 1 week (A) or 9 weeks (B) of treatment.** Female PyMT mice were gavaged daily with vehicle or I-BET 762 (60 mg/kg) for one week (A) or were fed control or I-BET 762 (60 mg/kg diet) diets for 9 weeks (B). Mammary glands (A and B) and spleens (B) were harvested, and immune cell populations were analyzed by flow cytometry as described in the material and methods.

**Suppl Fig 3: I-BET 762 and the rexinoid LG268 inhibits iNOS.** RAW 264.7 cells were treated with 30-300 nM I-BET 762 alone or combination with 100 nM LG100268 (LG268) and then stimulated with 2 ng/ml LPS for 24 h. Nitric oxide (NO) production was measured by the Griess assay, and results were normalized to LPS-stimulated controls. \*, p<0.05 vs. LG268 and I-BET 762 alone at the same concentration of I-BET 762; #, p<0.05 vs. LPS control.

**Suppl Fig 4: Western Blotting quantitation.** The band density of various proteins analyzed by western blotting in Fig. 4D was quantified by ImageJ and normalized to vinculin, the loading control. \*, p<0.05 vs. control; n = 5 lungs per group.

**Suppl Fig 5: c-Myc expression in mammary gland or lung tissue after I-BET 762 treatment.** Total protein was extracted from mammary glands or lung tissues in PyMT mice or A/J mice, respectively, and c-Myc expression was detected by western blotting. Each lane represents a different mouse.

**Suppl Fig 6: Immunohistochemistry quantitation.** The number of positively stained cells (brown), shown as a percentage of total cells, analyzed by immunohistochemistry (representative images shown in Fig. 4E and Fig. 5C) were quantified by ImageJ. \*, p<0.05 vs. control; n=4-6 per lungs per group.

**Suppl Fig 7: Effects of I-BET 762 on T cells in A/J mice.** Sixteen weeks after female A/J mice challenged with vinyl carbamate to induce lung cancer were started on control or I-BET 762 (40 mg/kg diet), two lobes of the lung were isolated and processed immediately for flow cytometry to detect T cells (CD3, CD4, CD8) in the lung.