**Supplemental Figure 1. Loss of ErbB3 impairs hyperplasia of MMTV-Neu mammary glands.**

A. Histological analysis of mammary glands harvested from 12-week old virgin female mice reveal that diffuse epithelial hyperplasias induced upon expression of Neu (that rat ErbB2 homolog) are decreased upon loss of ErbB3, due to decreased cell proliferation (as shown by Ki67 immunohistochemistry) and by increased cell death (as shown by TUNEL analysis). B. Values represent the average TUNEL+ epithelial cells per total epithelial cells, N = 4 mammary glands per genotype, 5 random fields per sample. P value calculated using Student’s T-test.

**Supplemental Figure 2.** Immunohistochemical detection of ErbB3 in ErbB3\(^{FL+/X}\) X MMTV-Neu and ErbB3\(^{MMTV-KO}\) X MMTV-Neu mammary glands harvested at 12 weeks of age demonstrated that, although ErbB3 was lost in many ErbB3\(^{MMTV-KO}\) X MMTV-Neu cells, several ErbB3-positive cells were detected in the adjacent mammary epithelium, consistent with the idea that stochastic activity of Cre recombinase results in patchy ErbB3 retention.

**Supplemental Figure 3.** NiB3 cells expressing ErbB3WT and ErbB3 6F were injected into contralateral fatpads of nude mice. Mice were observed daily for palpable tumor formation. All mice developed tumors in both injected mammary fatpads by 10 days, and no difference in tumor latency was detected. Tumor-bearing mice were treated for 5 days with lapatinib (100 mg/kg daily), BKM120 (20 mg/kg daily), or vehicle (100 µl). Tumors were harvested 1 hour following final treatment. A. Mitotic index, calculated as the average number of mitotic figures per 400X field (N = 9-15/group), was similar in NiB3 tumors expressing ErbB3\(^{6F}\) as compared to those expressing ErbB3\(^{WT}\). B. TUNEL analysis of NiB3 tumors treated 5 days with lapatinib. C. The average number of TUNEL+ cells/400X field was measured in each lapatinib-treated tumors, demonstrating a statistically significant increase in TUNEL+ cells in tumors expressing ErbB3\(^{6F}\) as compared to those expressing ErbB3\(^{WT}\).