

Supplemental Table 1. Pathway Analysis of PAM50 Genes				
	Top 20 Genes 3 Networks Found (Activation Scores)	P Value	Top 7 Genes 1 Network Found	P Value
Canonical Signaling Pathways	Neuregulin signaling E2-Mediated S Phase Entry Wnt/ β -catenin signaling Endometrial cancer signaling HER2/HER3 signaling Cell cycle G1/S checkpoint Small cell lung cancer signaling STAT3 HER2 signaling in breast cancer Bladder cancer signaling	8.8 e-5 2.6 e-4 6.0 e-4 1.2 e-3 1.5 e-3 1.8 e-3 2.2 e-3 2.4 e-3 2.6 e-3 3.4 e-3	STAT3 Neuregulin signaling Polyamine regulation E2-mediated S phase entry Thyroid cancer signaling Transcriptional network/stem cells Endometrial cancer signaling Thrombopoietin signaling HER2/HER3 signaling Myc-mediated apoptosis	2.8 e-4 4.0 e-4 7.7 e-3 8.4 e-3 1.4 e-2 1.4 e-2 1.8 e-2 1.9 e-2 2.0 e-2 2.0 e-2
Upstream Regulators	R5020 (1.96) EP300 Trastuzumab HOXB4 SMARCE-1 Neuregulin-1 (1.98) Estrogen receptor Letrozole CCND1 β -Estradiol (2.14)	2.1 e-9 2.3 e-8 1.3 e-7 2.6 e-7 5.5 e-7 8.9 e-7 1.5 e-6 1.5 e-6 2.7 e-6 3.3 e-5	Bazedoxifene Premarin HOXB4 SMARCE1 mTor CSF1 Receptor Letrozole NRG1 EP300 Estrogen receptor	2.9 e-6 3.7 e-6 8.6 e-6 1.4 e-5 1.7 e-5 2.6 e-5 2.6 e-5 2.6 e-5 2.9 e-5 3.3 e-5
Functions	Cancer Reproductive system disease Proliferation of breast cancer Breast cancer Invasion of tumor cells (2.37) Viability of tumor cells (1.95) Cell cycle progression (1.18) Invasion of tumor cells (2.37) S phase (1.95) Cell cycle progression (1.18) Advanced malignant tumor	6.6 e-9 6.6 e-9 3.1 e-7 5.5 e-7 5.3 e-6 5.4 e-6 5.4 e-6 5.4 e-6 1.9 e-4 1.9 e-4 1.9 e-4	Cell Migration Proliferation of Tumor Cells Cancer Reproductive System Disease Cell Cycle Cell Development Renal Cell Carcinoma Breast Cancer Cancer Progression Bladder Cancer Development	4.2 e-7 5.2 e-6 7.0 e-6 1.1 e-5 1.4 e-5 4.2 e-5 1.4 e-4 1.6 e-4 2.4 e-4 2.6 e-4