

Supplemental Figures

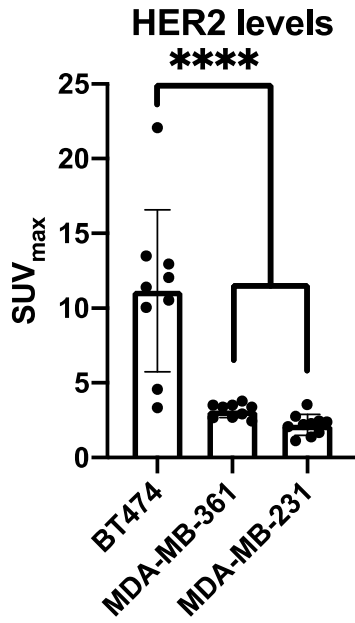


Figure S1. Standard uptake value (SUV) maximum (SUV<sub>max</sub>) of of [<sup>89</sup>Zr]-pertuzumab PET in two HER2+ (BT474, MDA-MB-361) and one HER2- (MDA-MB-231) tumor model. \*\*\*\*, p<0.0001.

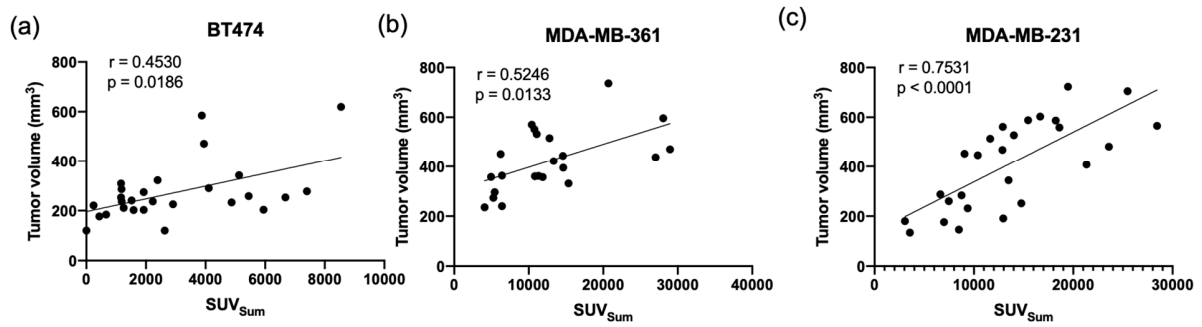
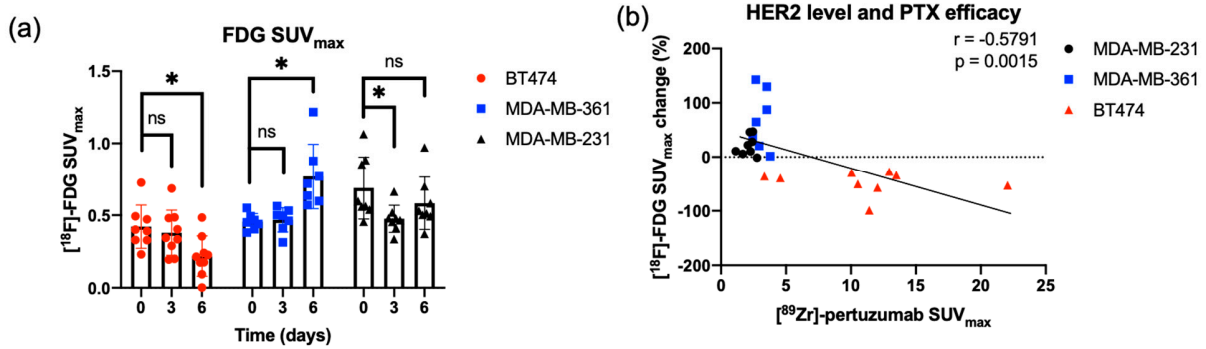
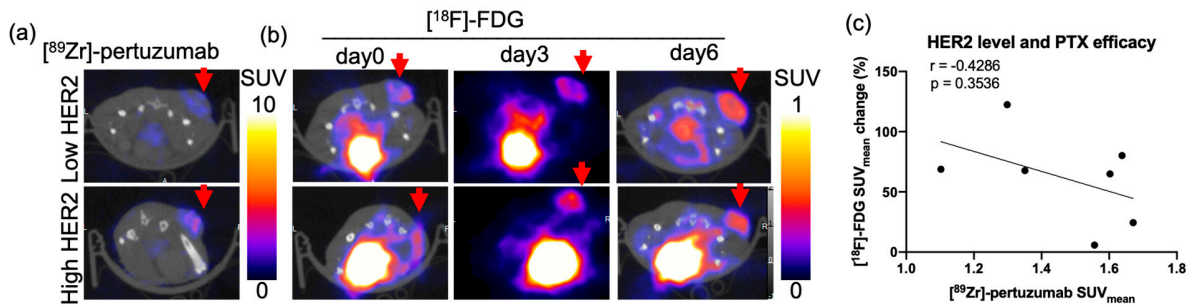


Figure S2. [<sup>18</sup>F]-FDG PET imaging reveals early cellular signaling of therapeutic response prior to changes in tumor volume. Sum of standard uptake value (SUV) of [<sup>18</sup>F]-FDG PET is correlated with tumor volume measured by caliper in BT474 (a), MDA-MB-361 (b), and MDA-MB-231 (c). Spearman's correlation: MDA-MB-231 ( $r=0.7531$ ,  $p<0.0001$ ), MDA-MB-361 ( $r=0.5246$ ,  $p=0.0133$ ), BT474 ( $r=0.4530$ ,  $p=0.0186$ ).



**Figure S3. HER2 expression level is positively correlated with paclitaxel treatment efficacy.** (a) SUV<sub>max</sub> of [18F]-FDG in BT474, MDA-MB-361, and MDA-MB-231 tumors from day 0 to day 6. (ANOVA and Tukey's multiple comparisons test: ns, non-significant,  $p < 0.05$ ). (b) The percentage changes of SUV<sub>max</sub> of [18F]-FDG from day 3 to day 6 are negatively correlated with SUV<sub>max</sub> of [89Zr]-pertuzumab (Spearman's correlation:  $r = -0.5791$ ,  $p = 0.0015$ ).



**Figure S4. HER2 expression level is correlated with paclitaxel treatment efficacy in MDA-MB-361 tumor model.** (a) Representative [89Zr]-pertuzumab PET images of MDA-MB-361 tumors with high and low HER2 levels in transverse section. Red arrows point at tumors. (b) Representative [18F]-FDG PET images of MDA-MB-361 tumors with high and low HER2 levels from day 0 to day 6 in transverse section. Red arrows point at tumors. (c) The percentage changes of SUV<sub>mean</sub> of [18F]-FDG from day 0 to day 6 are negatively correlated with SUV<sub>mean</sub> of [89Zr]-pertuzumab in MDA-MB-361 tumors (Kendall tau correlation:  $r = -0.3333$ ,  $p = 0.2595$ ).