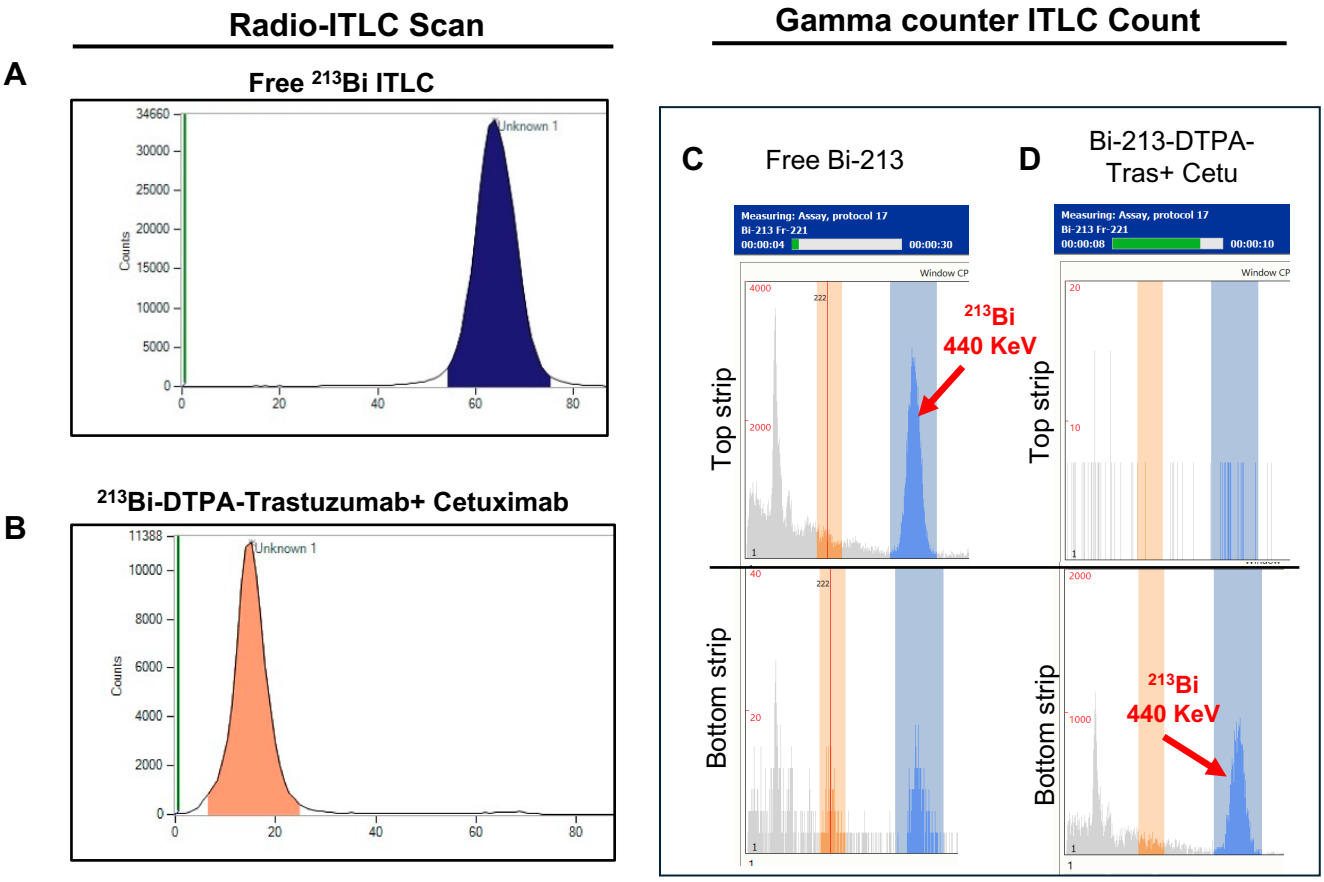
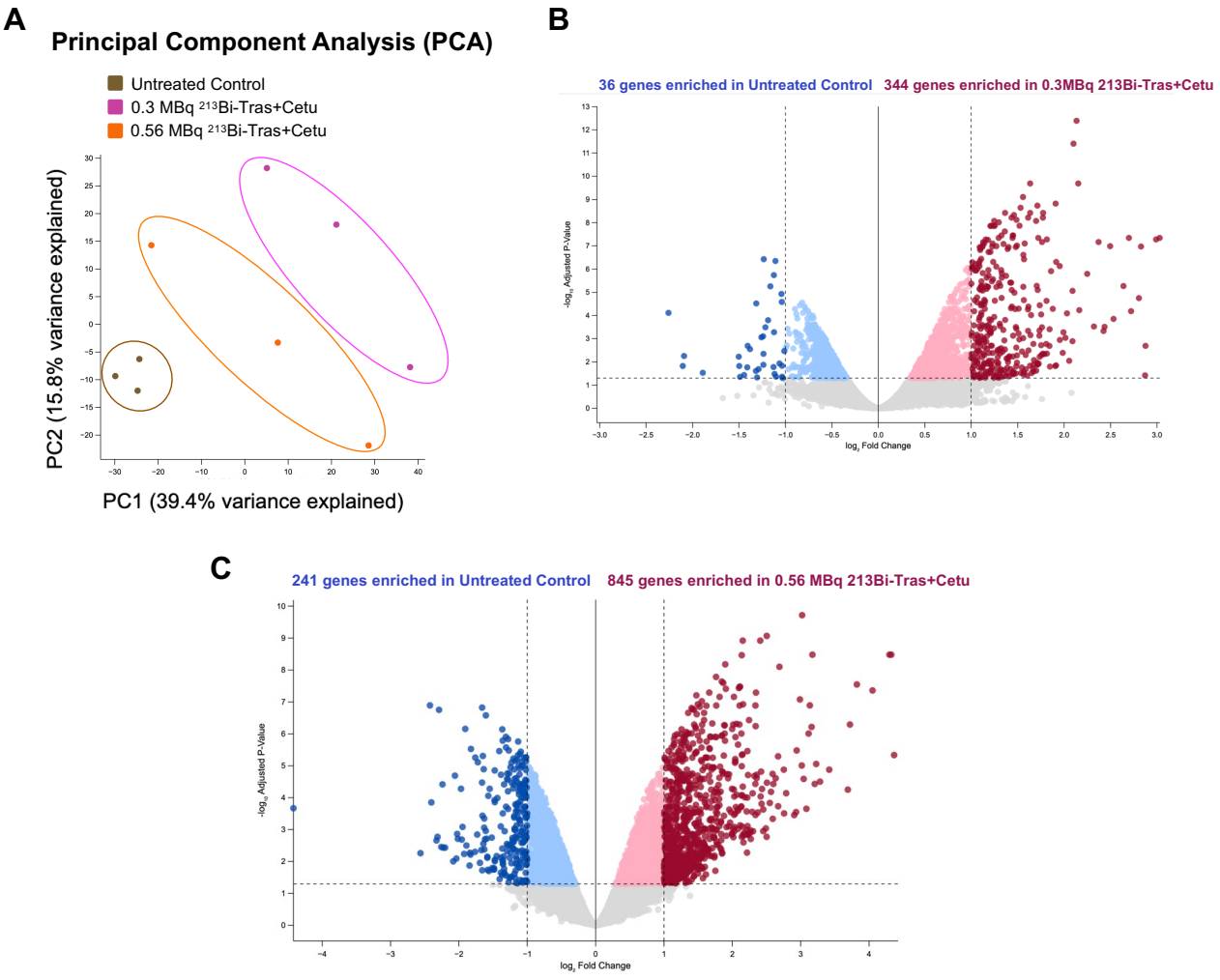
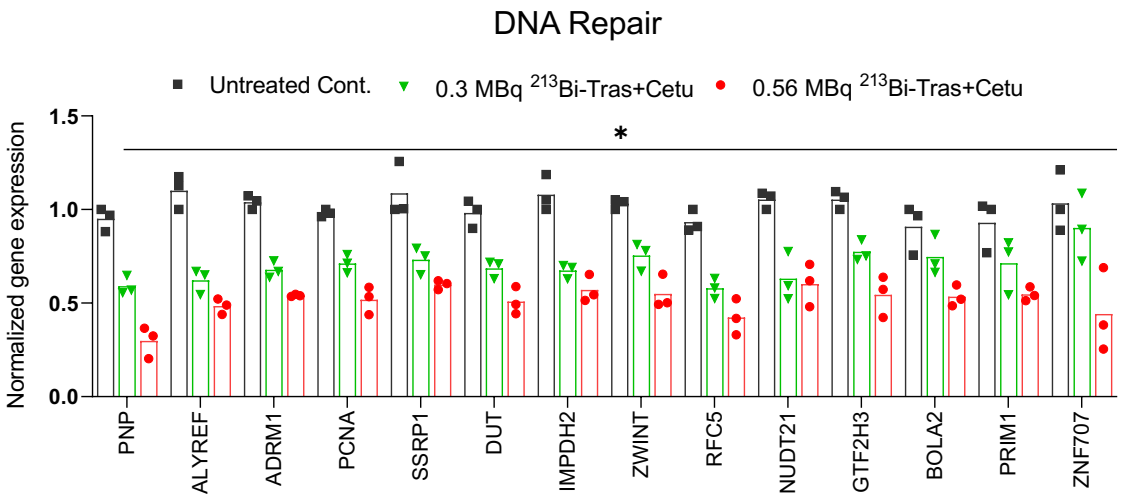


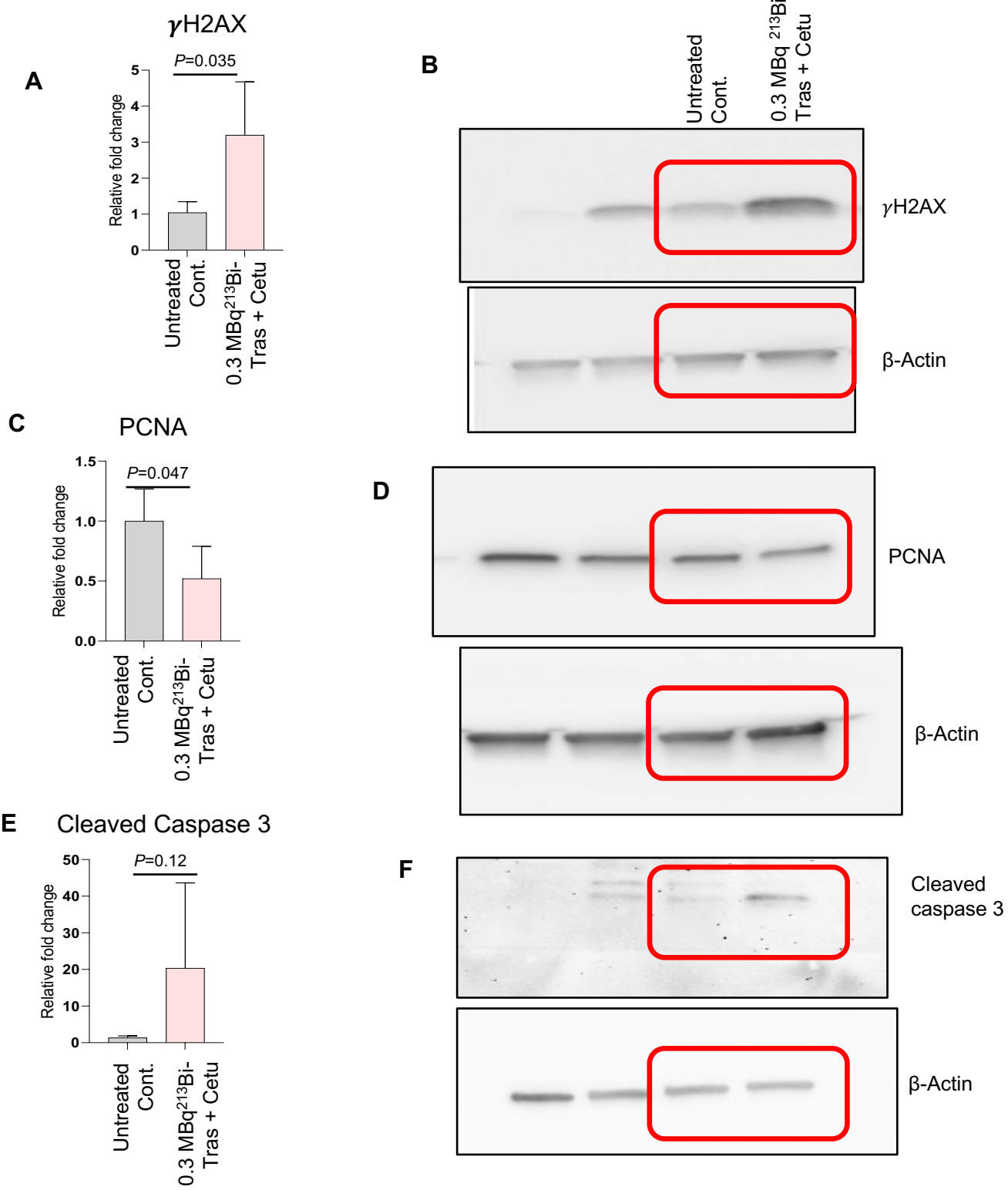
Supplementary Figure 1. Radiochemical purity analyzed with radio TLC scanner and Gamma counter for ^{213}Bi-trastuzumab+cetuximab. (A-D) ITLC chromatograms of (A, C) free ^{213}Bi and (B, D) ^{213}Bi-trastuzumab+cetuximab using 10 mM sodium citrate, pH 5.0, solvent scanned on Radio-ITLC and counted on a Gamma counter with an energy peak corresponding to ^{213}Bi (440.5 keV), respectively.



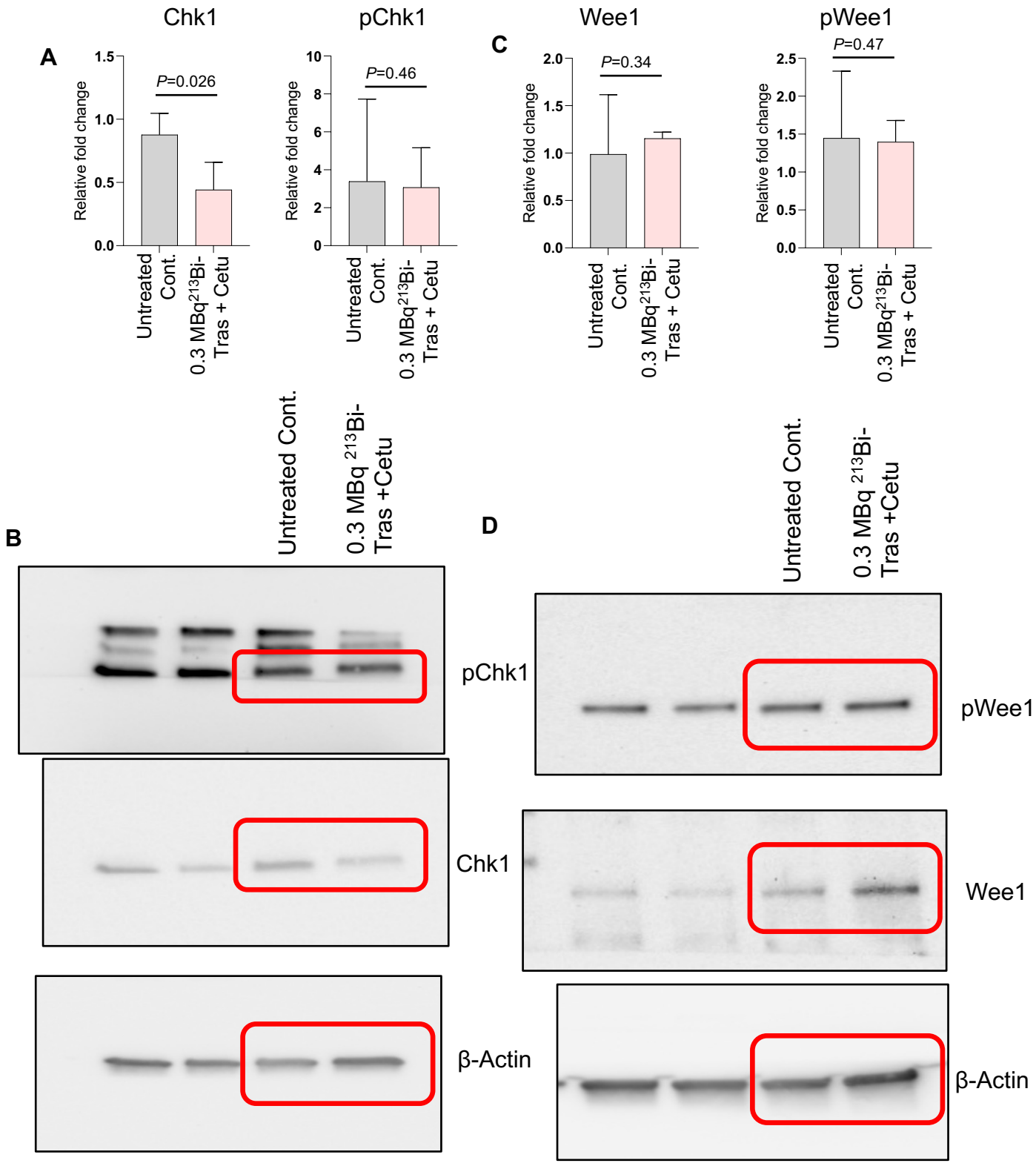
Supplementary Fig 2 Transcriptome analysis revealed alterations in gene expression in SCaBER cells after ^{213}Bi-trastuzumab+cetuximab treatment. (A) Principal-component analysis (PCA) plot showing distinct clustering of the untreated control, 0.3 MBq, and 0.56 MBq ^{213}Bi-trastuzumab+cetuximab treatment groups. (B, C) The volcano plot displays log2 fold change versus -$\log_{10}$ FDR-adjusted p-values for all analyzed genes. Genes with a fold change ≥ 2 or ≤ 0.5 and an FDR < 0.05 were considered significantly differentially expressed. Significantly downregulated in untreated control samples (blue), upregulated in (B) 0.3 MBq, and (C) 0.56 MBq ^{213}Bi-trastuzumab+cetuximab treatment groups (red). Non-significant genes are shown in gray. Vertical dashed lines indicate fold change thresholds, and the horizontal dashed line indicates the significance threshold (FDR < 0.05).



Supplementary Fig 3 Dose-dependent inhibition of DNA repair markers expression in SCaBER cells after ^{213}Bi-trastuzumab+cetuximab treatment. Transcriptomic analysis showing dose-dependent inhibition of DNA repair markers expression in SCaBER cells after 0.3 MBq and 0.56 MBq of ^{213}Bi-trastuzumab+cetuximab treatment compared to untreated control.



Supplementary Fig. 4 Densitometric analysis data for immunoblot. (A, C, E) Bar graph showing densitometric analysis data for γH2AX, PCNA, and cleaved caspase 3 for immunoblot in SCaBER human bladder cancer cells after 48 hours of 0.3 MBq ^{213}Bi212-trastuzumab+cetuximab and untreated control. (B, D, F) The respective uncropped Western blot images for γH2AX, PCNA, and cleaved caspase 3, presented in Figure 4E and F. Membranes were often cut to enable blotting with multiple antibodies. Student's t-test was used for all statistical analyses. P-value <0.05 was considered significant; the red box depicts representative images used in Figure 4E, F.



Supplementary Fig. 5 Densitometric analysis data for immunoblot. (A) Bar graph showing densitometric analysis data for cell cycle checkpoint markers (A) Chk1 and (C) Wee1 expression and activation in SCaBER human bladder cancer cells after 48 hours of 0.3 MBq ^{213}Bi212-trastuzumab+cetuximab and untreated control. (B, D) Respective uncropped Western blot images for (B) pWee1, Wee1, and (D) pChk1 and Chk1 are presented in Figure 5C and D. Membranes were often cut to enable blotting for multiple antibodies. Student's t-test was used for all statistical analyses. P-value <0.05 was considered significant; the red box depicts representative images used in Figure 5C, D.