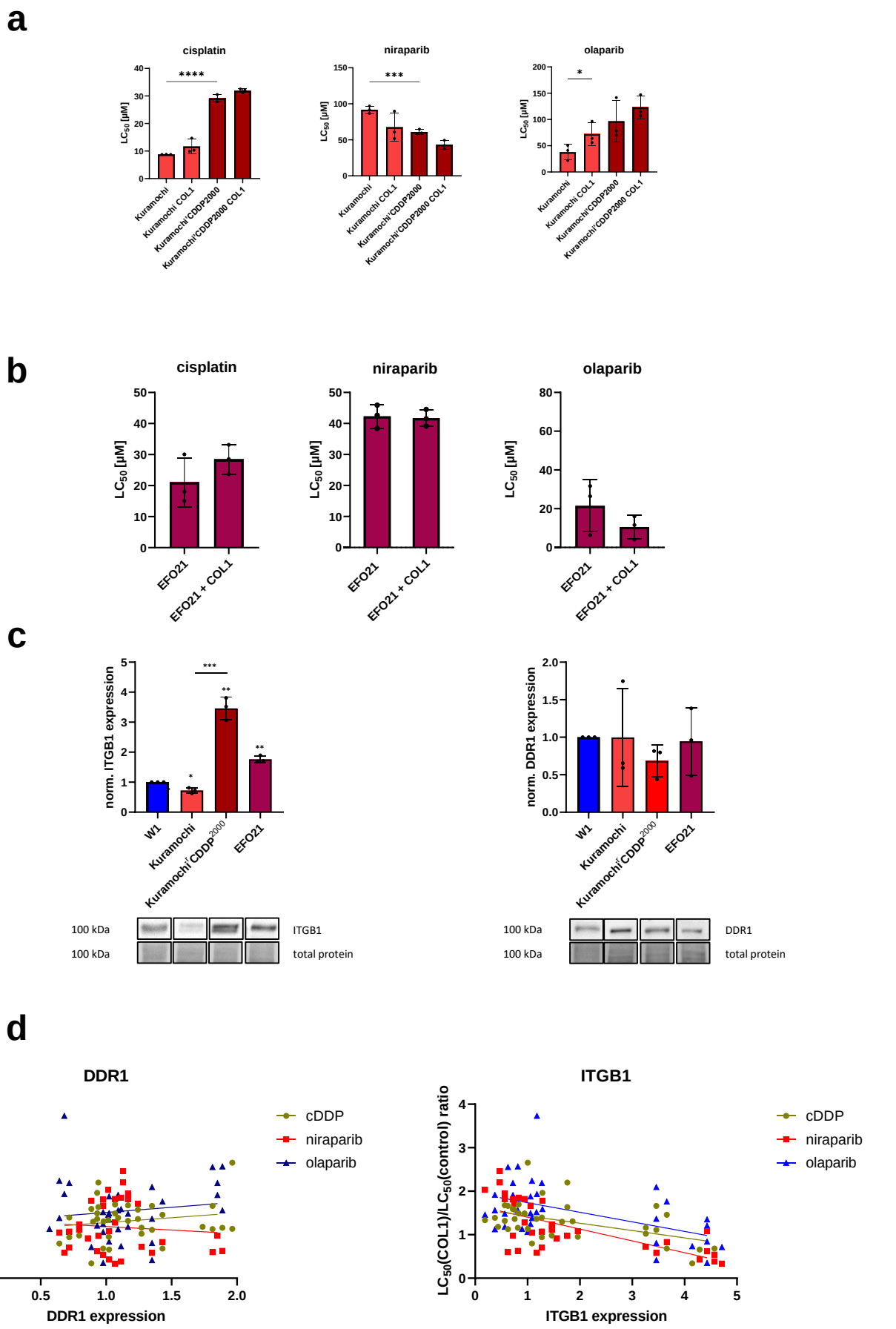
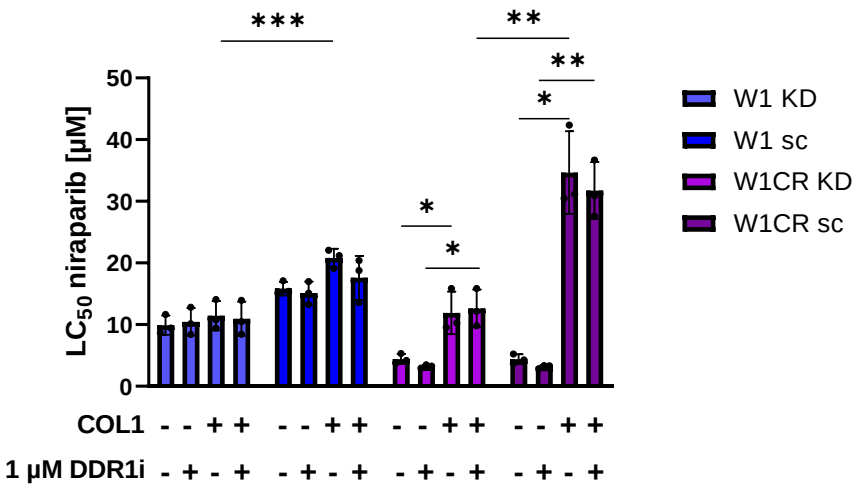
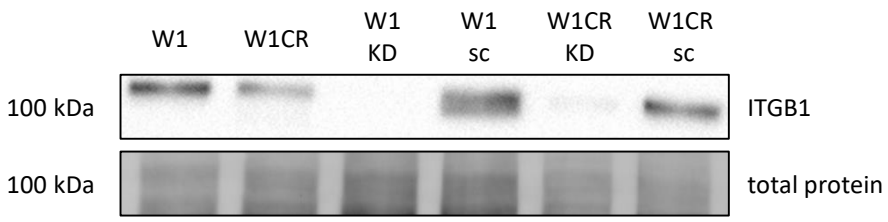


Supplement Figure 1: **a-b** IC_{50}-values of either cDDP, niraparib or olaparib in the Kuramochi cell pair and EFO21 cells in the absence or presence of COL1 (cisplatin-sensitive cells in brighter red and cisplatin-resistant in darker red). Mean ± SD (n = 3). Statistical analysis was performed using paired *t*-tests, **P* < 0.05, ***P* < 0.01; ****P* < 0.001, ****P < 0.0001. **c** Analysis of ITGB1 and DDR1 expression in W1, Kuramochi, Kuramochi'CDDP2000 and EFO21 cells. Histogram displays the relative protein expression of the respective protein normalized on untreated W1 cells. Protein bands of representative Western Blots are shown below the histogram. Data represent means ± SD (n = 3). To test for significance paired *t*-tests were applied for cultivation and unpaired *t*-tests for cell line comparison. **P* < 0.05, ***P* < 0.01. **d** Correlation of the individual IC50-values and the respective ITGB1 and DDR1 expression in all investigated cell lines and the indicated cytotoxic drug.

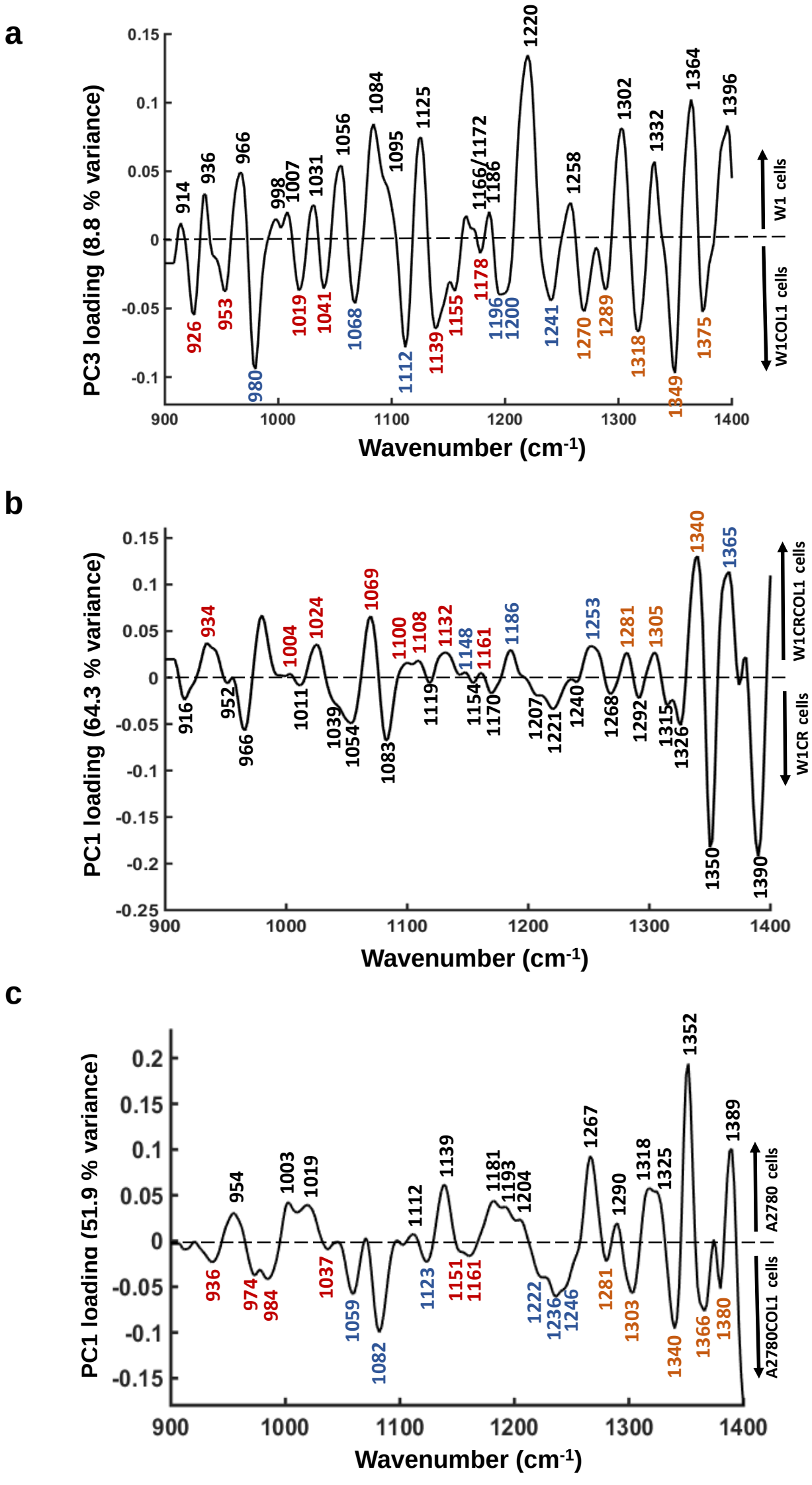
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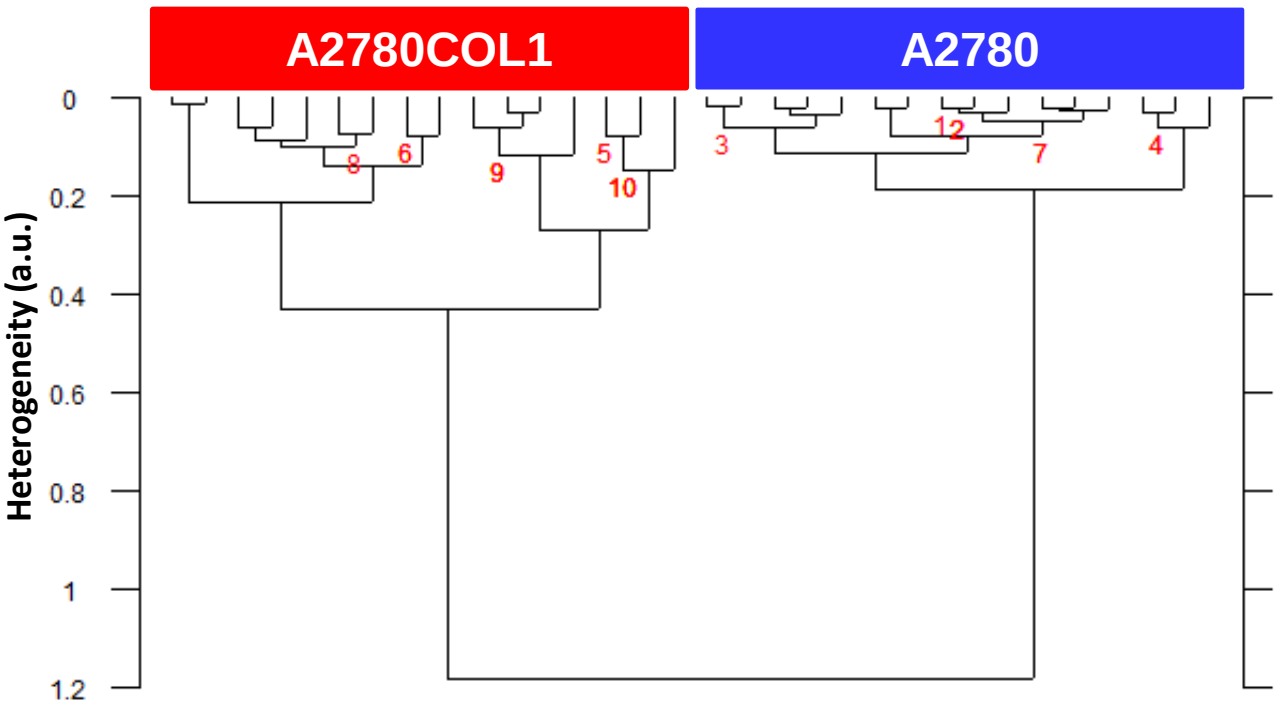
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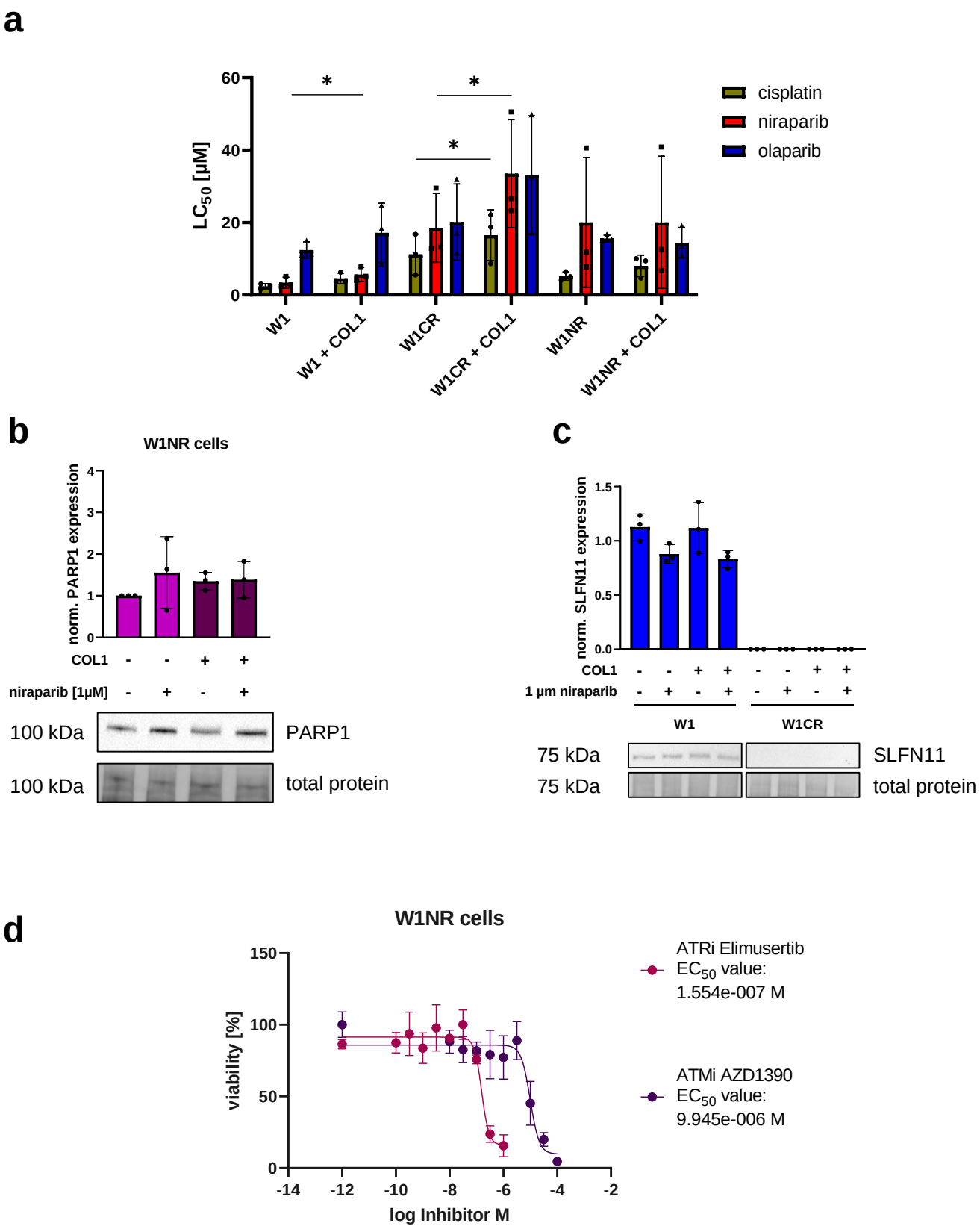
Supplement Figure 2: **a** IC_{50}-values of niraparib in W1 and W1CR cells harboring an ITGB1 knockdown or a scramble control in the absence or presence of COL1 and the DDR1 inhibitor 7rh. Mean ± SD (n = 3). Statistical analysis was performed using paired *t*-tests, **P* < 0.05, ***P* < 0.01; ****P* < 0.001. **b** Protein bands of a representative Western blot displaying the effectiveness of the ITGB1 knockdown in W1 and W1CR cells.



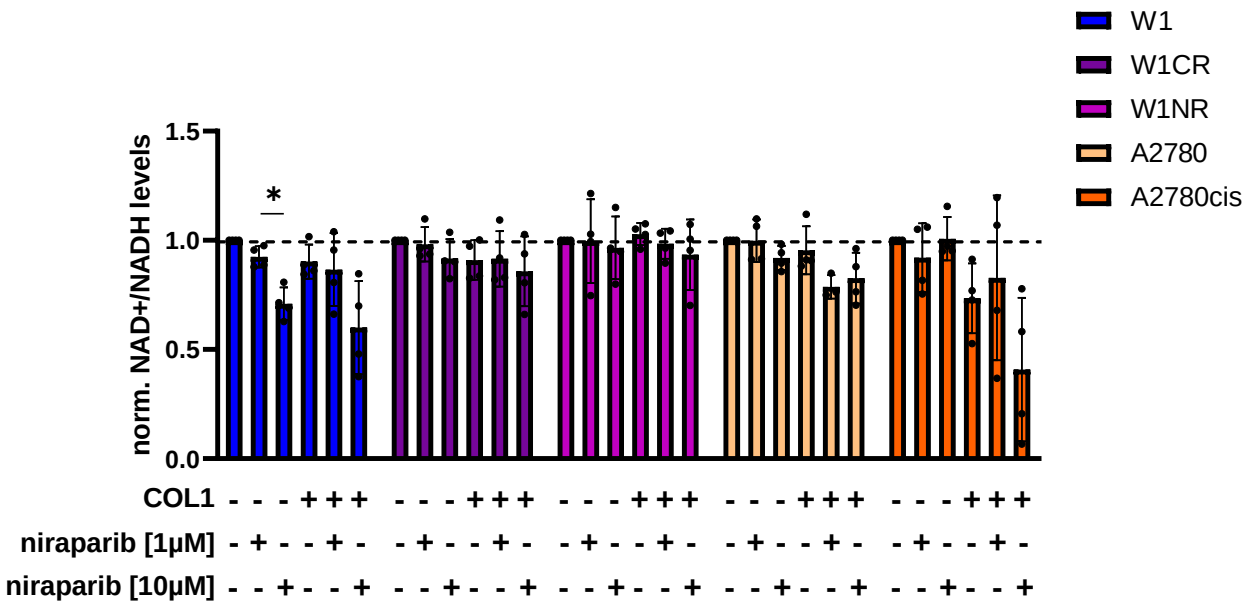
Supplement Figure 3: PCA analysis of second derivative FTIR spectra in the spectral range 900–1400 cm^{-1} of cells showing (a) PC3 loading separating W1/WICOL1, (b) PC1 loading differentiating W1CR/W1CRCOL1 and (c) PC1 loading delineating A2780/A2780COL1. Cells grown on collagen 1 coating exhibit the following tentative assignments: carbohydrate, phosphate-containing functions, and protein amide III signatures.



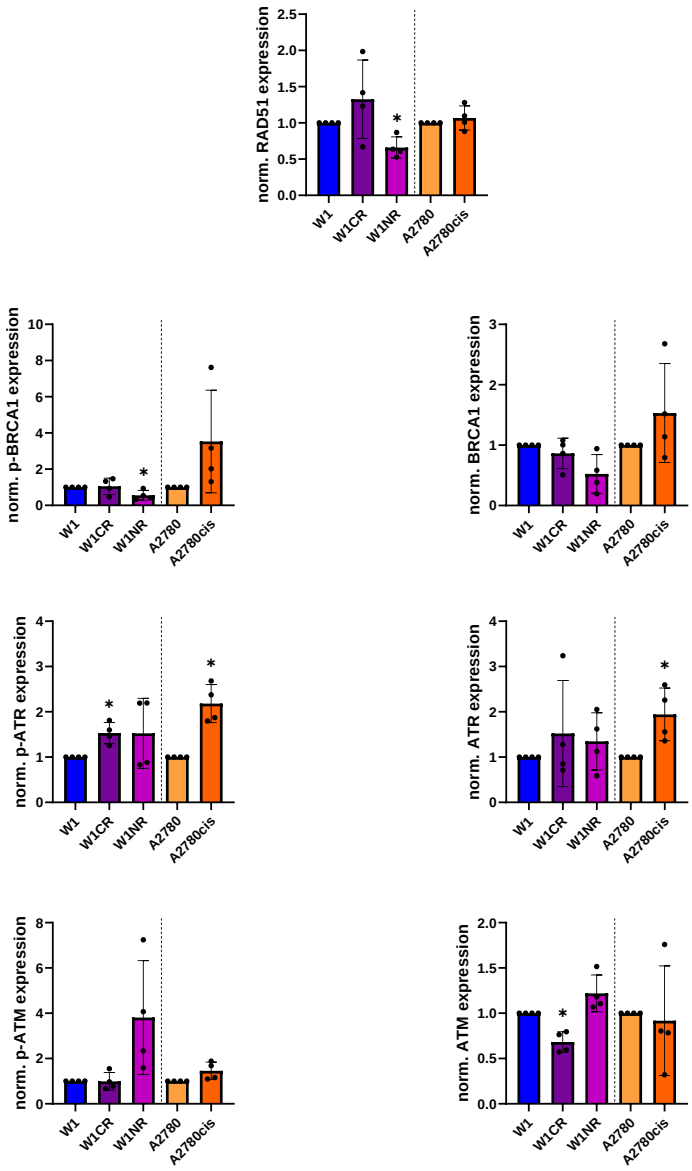
Supplement Figure 4: Hierarchical Cluster Analysis (HCA) of A2780 cells and A2780COL1 cells computed on the 900-1400 cm^{-1} spectral range. Baseline correction, second derivation and vector normalization were performed prior to the analysis.



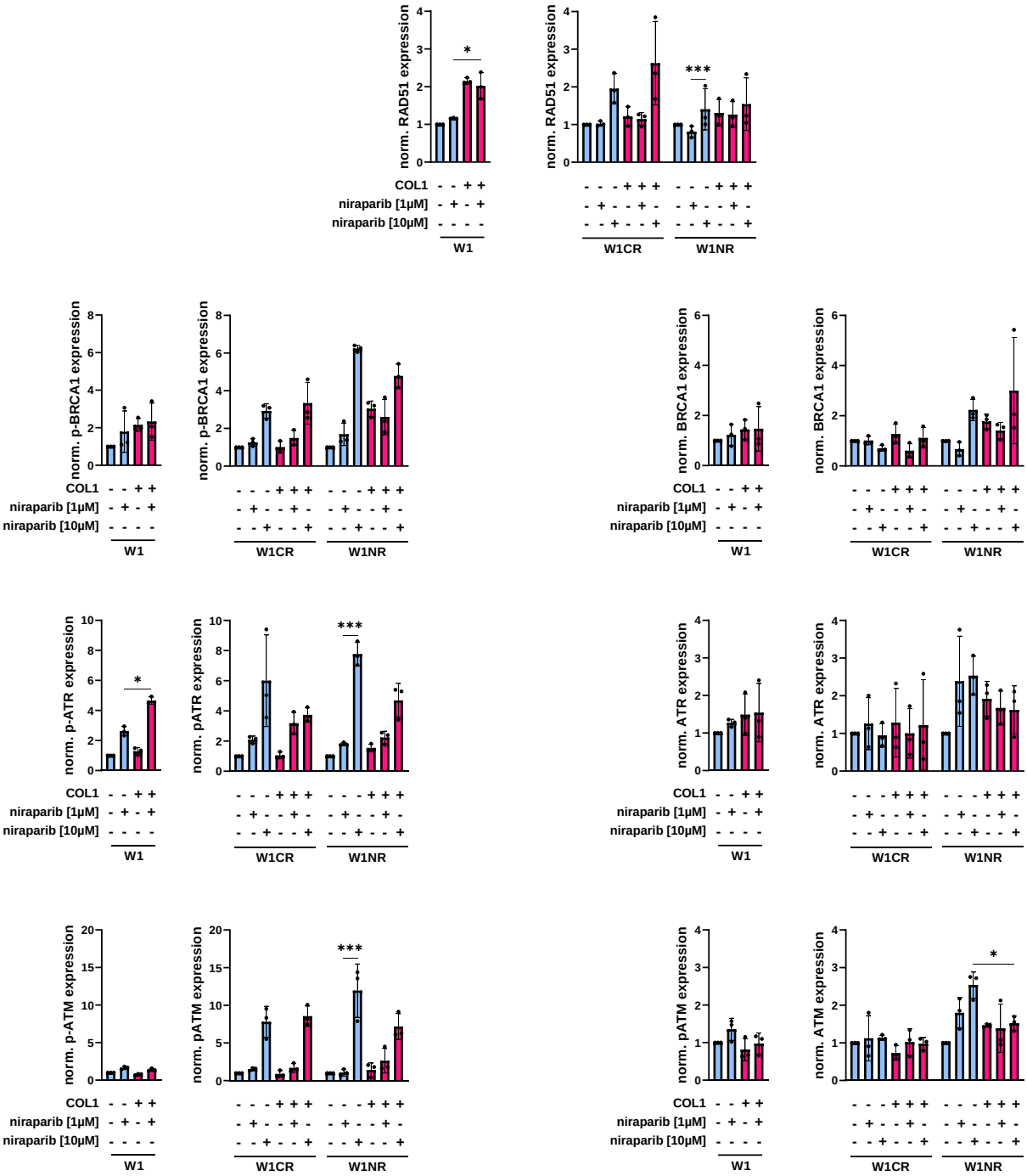
Supplement Figure 5: **a** LC_{50}-values of cDDP, niraparib and olaparib in W1, W1CR and W1NR cells cultivated with and without COL1. Mean ± SD (n = 3). Statistical analysis was performed using paired *t*-tests, **P* < 0.05. **b** Representative Western Blot of PARP1 expression in niraparib treated and untreated W1NR cells in the absence or presence of COL1. Histogram displays the relative protein expression of the respective protein normalized on untreated W1NR cells. Protein bands of representative Western Blots are shown below the histogram. Data represent means ± SD (n = 3). To test for significance paired *t*-tests were applied for cultivation and treatment. **c** Western Blot analysis of SLFN11 expression in W1 and W1CR cells, treated with and without niraparib. The cells were cultivated with and without COL1. Histogram show the relative protein expression normalized on untreated W1 and W1CR cells. Protein bands of representative Western Blots are shown below the histogram. Data represent means ± SD (n = 3). To test for significance paired *t*-tests were applied for cultivation and treatment. **d** Representative MTT viability curves of W1NR cells treated with half logarithmic dilution series of the ATRi inhibitor elimusertib and the ATMi AZD1390. Data represent means ± SD (n = 3)



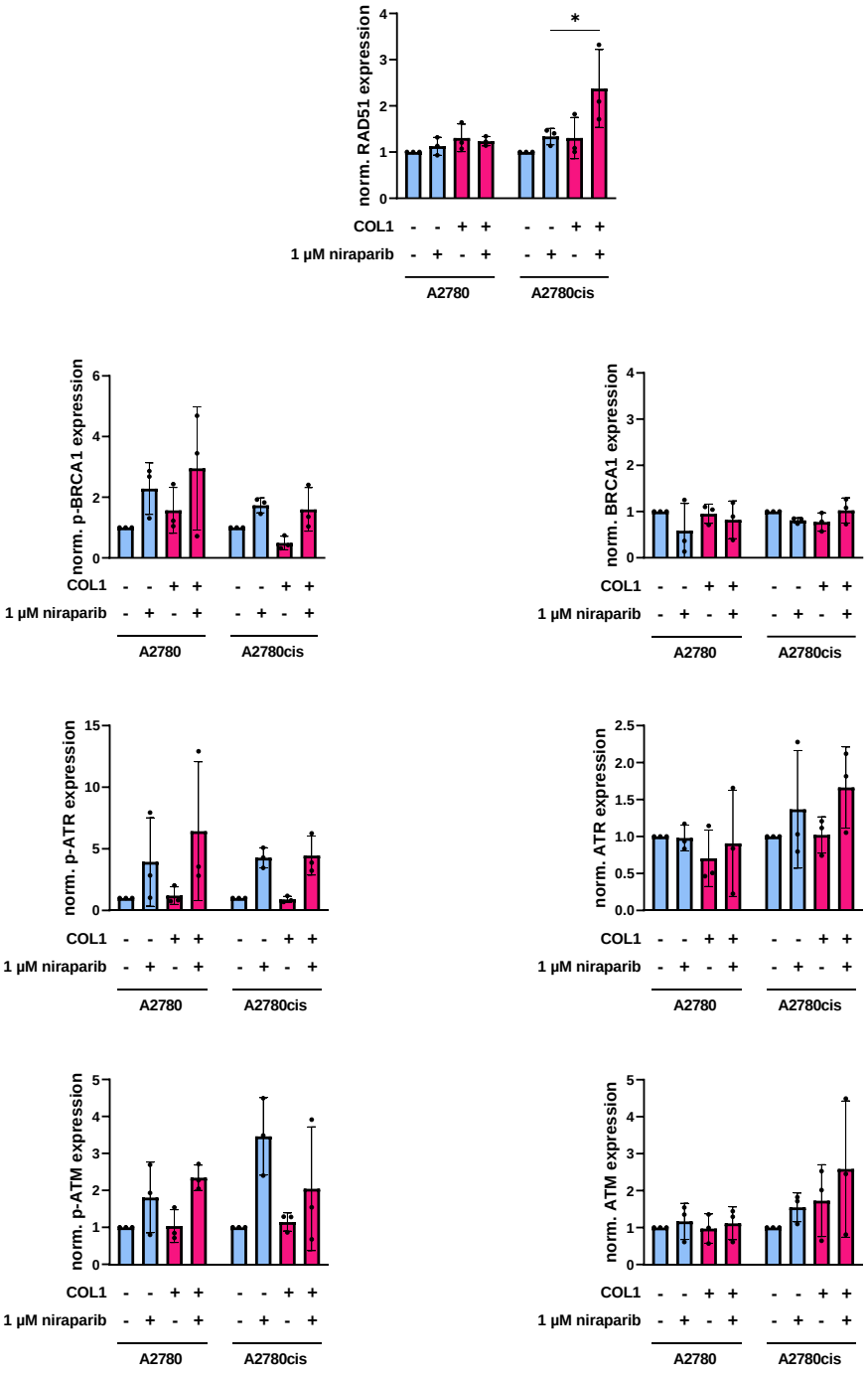
Supplement Figure 6: Histogram of the relative NAD+/NADH levels in W1, W1CR, W1NR, A2780 and A2780cis cells, treated with either 1 µM or 10µM niraparib for 24 hours or untreated, normalized to the respective untreated controls. All cells were cultivated with or without COL1. Data are according to the heatmap shown in Fig. 3 b and represent means ± SD (n = 3). To test for significance two-way ANOVA with tukey correction were applied, *$P < 0.05$



Supplement Figure 7: Western Blot analysis of the expression and activity of different DNA repair proteins in W1 and A2780 cells as well as their resistant sublines. Histograms display the relative protein expression of the respective protein normalized on untreated W1 and A2780 cells. Data represent means ± SD (n = 3). For significance analysis unpaired *t*-tests were performed, *$P < 0.05$

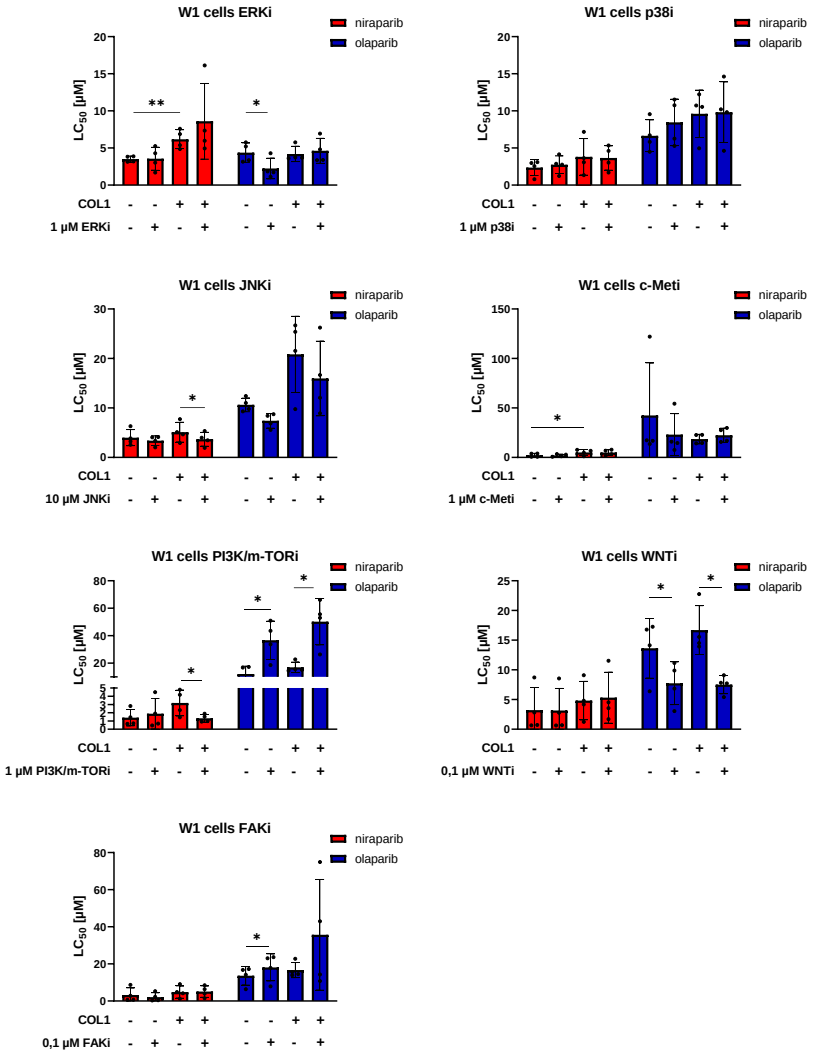


Supplement Figure 8: Western blot analysis of the expression and activity of various DNA repair proteins in W1 and its resistant sublines in the presence and absence of COL1. Cells were treated with niraparib at a concentration of either 1 µM or 10 µM or remained untreated. Due to its high sensitivity to niraparib, W1 cells were only treated with 1 µM niraparib. Histograms display the relative protein expression of the respective protein normalized on untreated controls. Data are according to the heatmap shown in Fig. 4 b and represent means ± SD (n = 3). For significance analysis paired *t*-tests were performed, **P* < 0.05, ***P* < 0.01; ****P* < 0.001

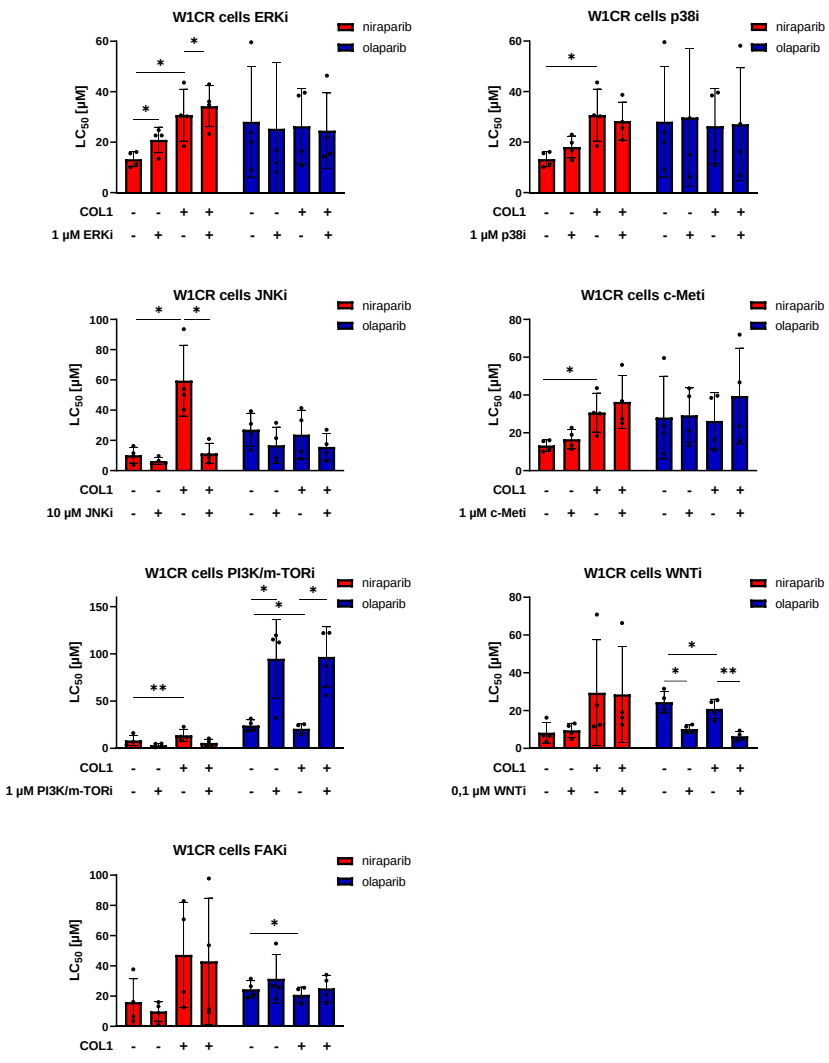


Supplement Figure 9: Western blot analysis of the expression and activity of various DNA repair proteins in A2780 cells and its cisplatin-resistant subline in the presence and absence of COL1. Cells were treated with 1 µM niraparib or remained untreated. Histograms display the relative protein expression of the respective protein normalized on untreated controls. Data represent means ± SD (n = 3). For significance analysis paired *t*-tests were performed, *$P < 0.05$,

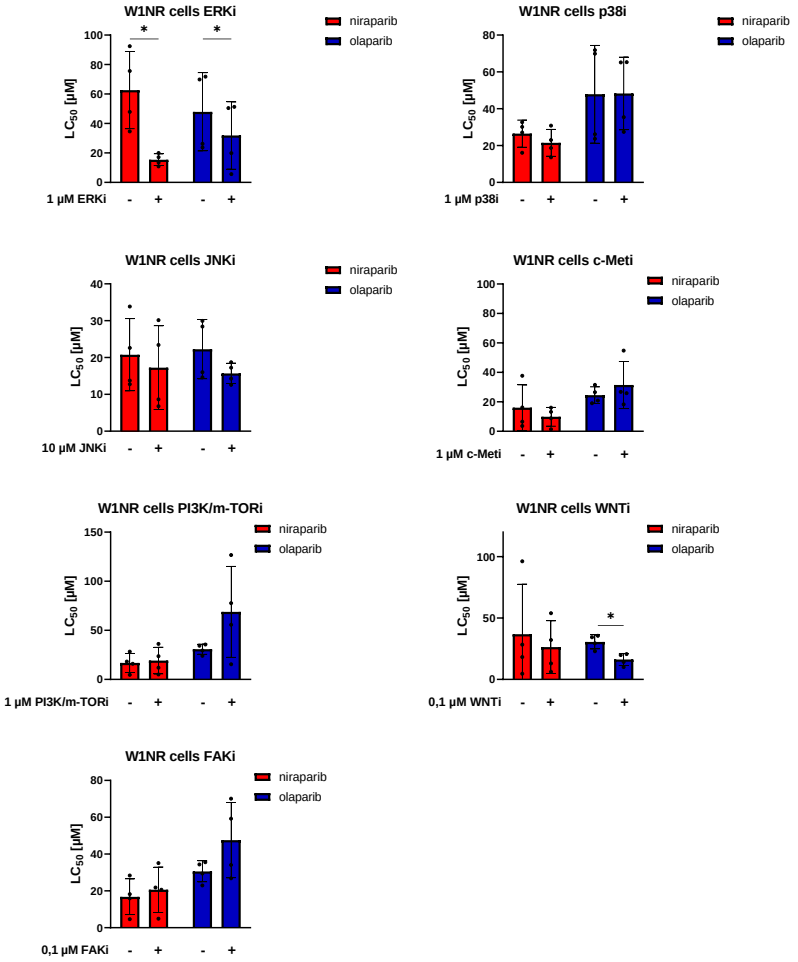
a


W1 cells ERKi
W1 cells p38i
W1 cells JNKi
W1 cells c-Meti
W1 cells PI3K/m-TORi
W1 cells WNTi
W1 cells FAKi
niraparib
olaparib
LC50 [µM]
COL1
1 µM ERKi
1 µM p38i
10 µM JNKi
1 µM c-Meti
1 µM PI3K/m-TORi
0,1 µM WNTi
0,1 µM FAKi

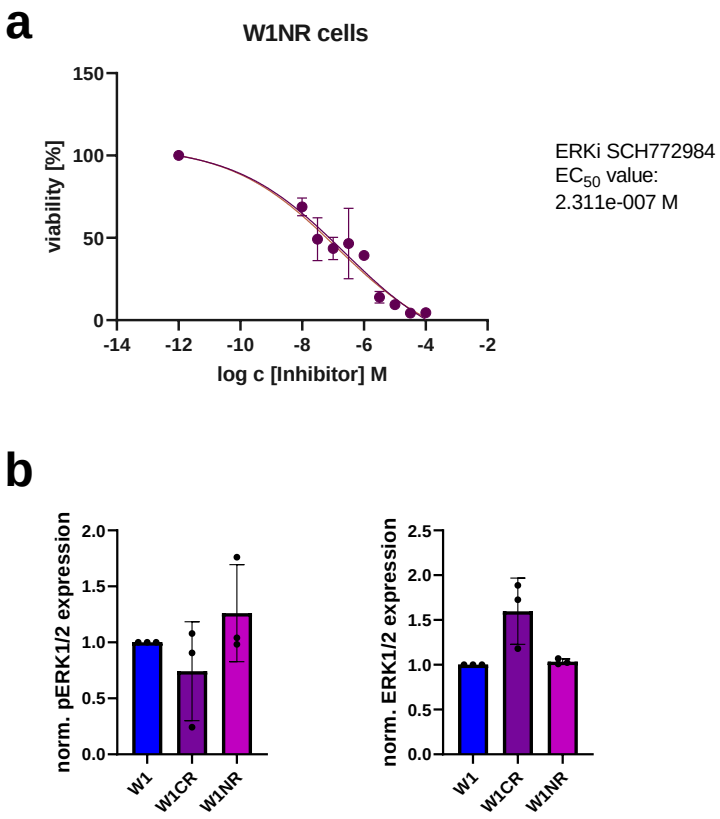
b


W1CR cells ERKi
W1CR cells p38i
W1CR cells JNKi
W1CR cells c-Meti
W1CR cells PI3K/m-TORi
W1CR cells WNTi
W1CR cells FAKi
niraparib
olaparib
LC50 [µM]
COL1
1 µM ERKi
1 µM p38i
10 µM JNKi
1 µM c-Meti
1 µM PI3K/m-TORi
0,1 µM WNTi
0,1 µM FAKi

Supplement Figure 10: **a-b** IC_{50}-values of either niraparib or olaparib in W1 (**a**) and W1CR (**b**) cells in the absence or presence of COL1 (niraparib in red and olaparib). Cells were solo treated or in combination with JNK1/2/3 (tanzisertib) [10 µM], p38 MAPK inhibitor (adezmapimod) [1 µM], ERK1/2 inhibitor (SCH772984) [1 µM], ALK/c-Met (crizotinib) [1 µM], pan-PI3K/m-TOR (dactolisib) [1 µM], WNT (pyrivinium) [0,1 µM], and FAK (FAK-IN-14) [0,1 µM]. Data are according to the heatmap shown in Fig. 5 a-d, Mean ± SD (n = 4). Statistical analysis was performed using paired *t*-tests, **P* < 0.05, ***P* < 0.01;



Supplement Figure 11: IC_{50}-values of either niraparib or olaparib in W1NR cells in the absence or presence of COL1 (niraparib in red and olaparib). Cells were solo treated or in combination with JNK1/2/3 (tanzisertib) [10µM], p38 MAPK inhibitor (adezmapimod) [1 µM], ERK1/2 inhibitor (SCH772984) [1 µM], ALK/c-Met (crizotinib) [1 µM], pan-PI3K/m-TOR (dactolisib) [1 µM], WNT (pyrivinium) [0,1 µM], and FAK (FAK-IN-14) [0,1 µM]. Data are according to the heatmap shown in Fig. 5 e, Mean ± SD (n = 4). Statistical analysis was performed using paired *t*-tests, **P* < 0.05, ***P* < 0.01;



Supplement Figure 12: **a** Representative MTT viability curve of W1NR cells treated with half logarithmic dilution series of the ERK inhibitor SCH772984. Data represent means ± SD (n = 3). **b**: Western blot analysis of the expression and activity of ERK1/2 in W1 cells and its resistant sublines. Histograms display the relative protein expression of the respective protein normalized on W1 cells. Data represent means ± SD (n = 3). For significance analysis unpaired *t*-tests were performed.