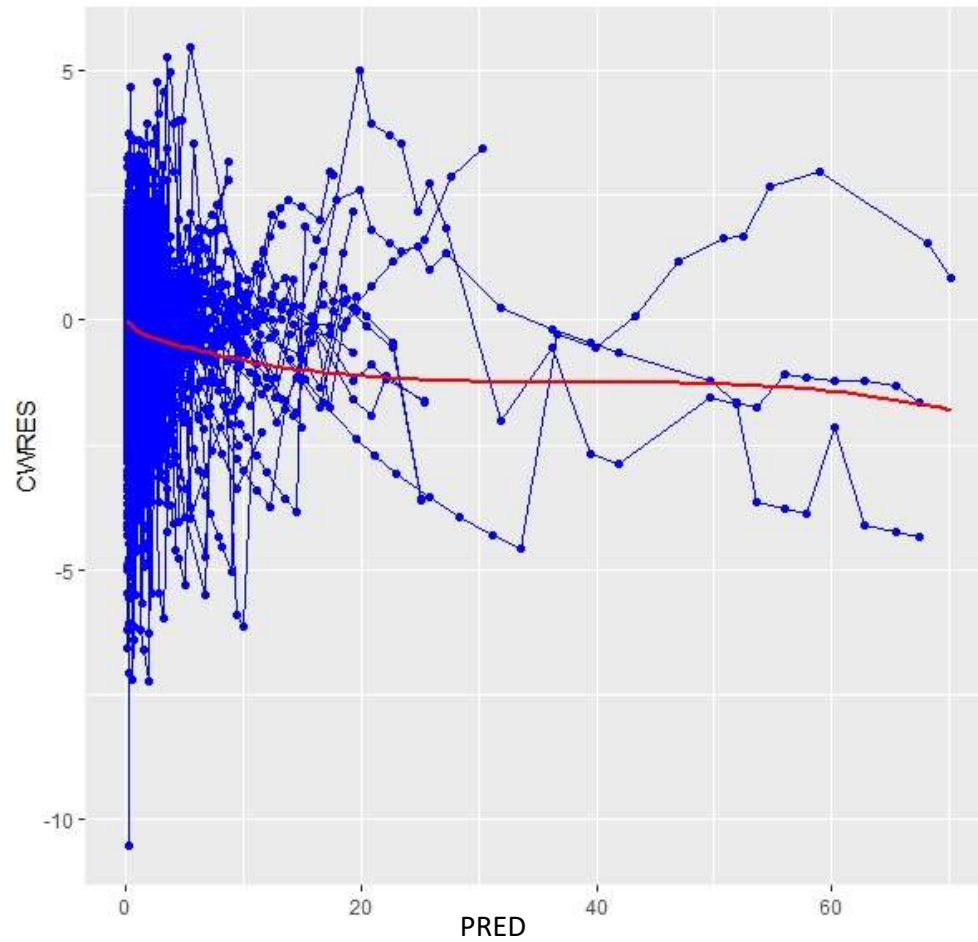
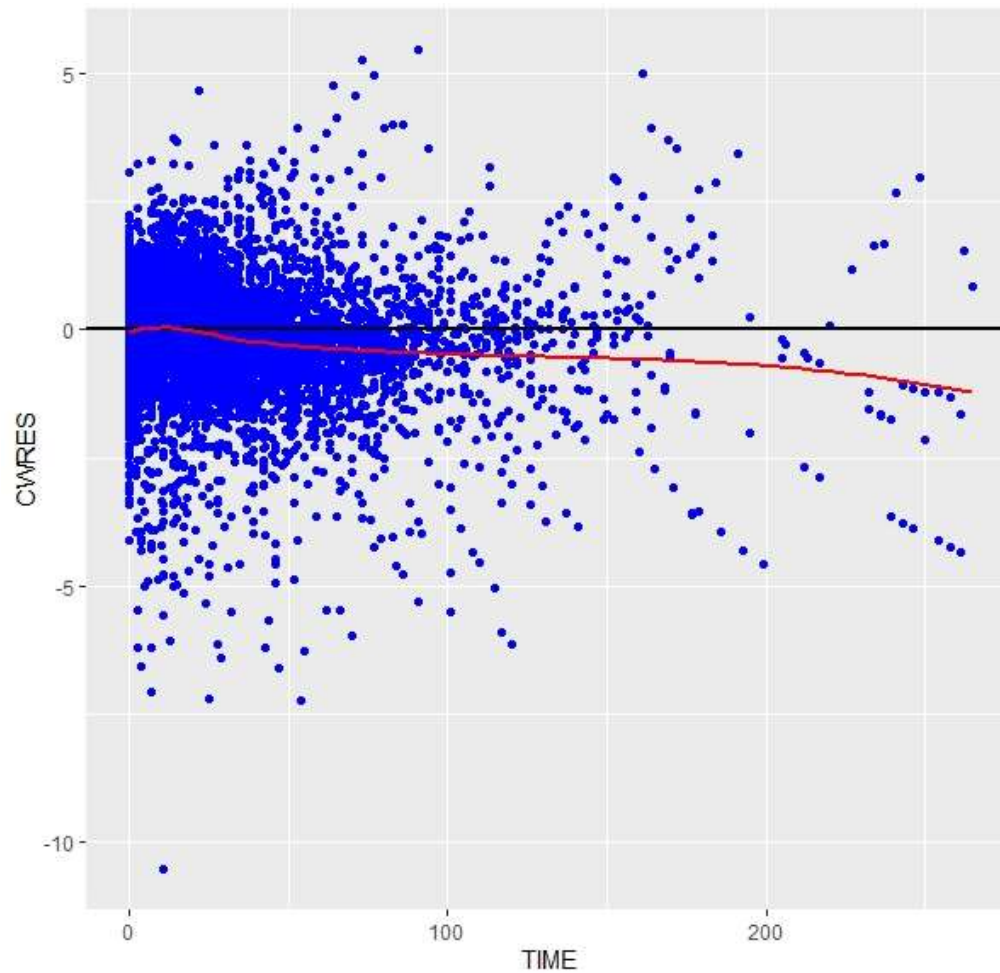


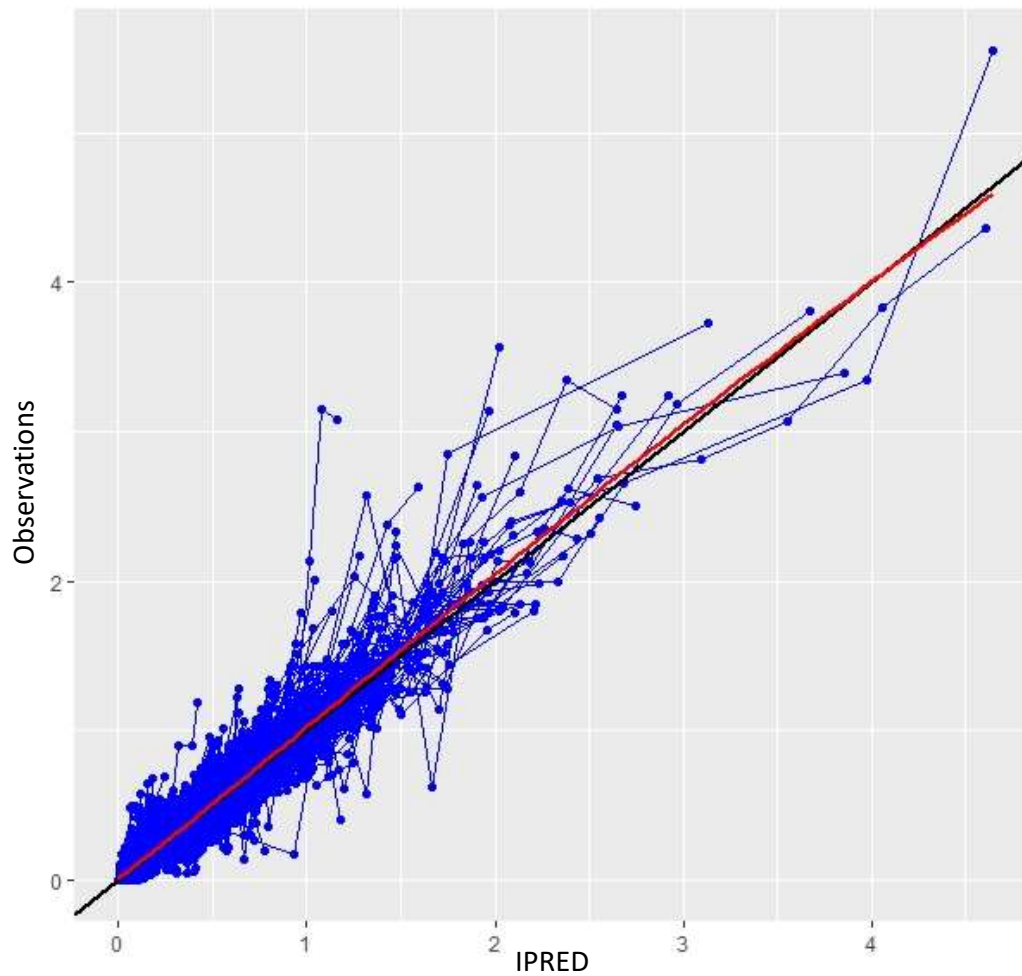
**Supplementary Figure 1.** Conditional weighted residuals (CWRES). Conditional weighted residuals density for olaparib monotherapy fitting. The assumption for the residuals in the nonlinear mixed effects framework is normality and the residual plots must resemble a normal distribution.



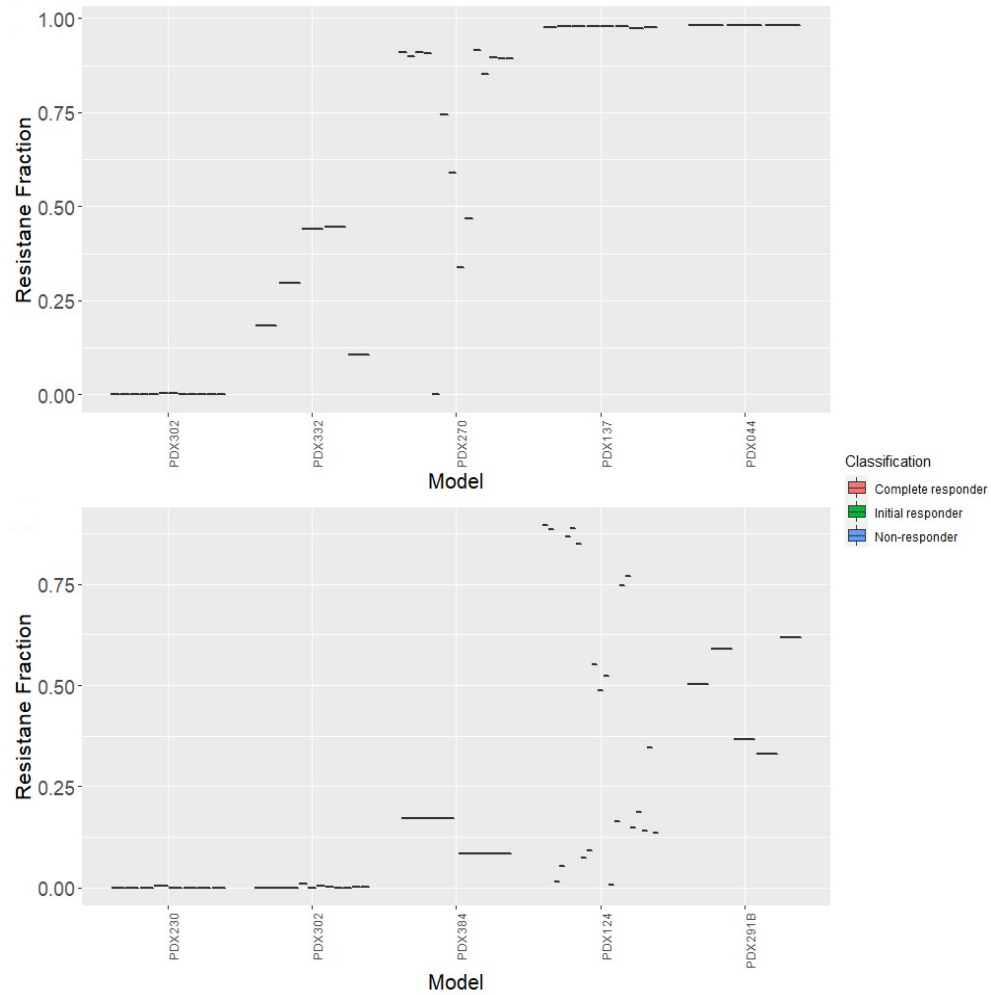
**Supplementary Figure 2.** Conditional weighted residuals vs population predication (PRED). Conditional weighted residuals versus predicted tumour volume for the olaparib monotherapy resistance model. The residual must be centred around zero and show no visible trend in order to satisfy the assumptions made by the NLME framework. That is satisfied initial with a trend developing at later times due to drop out.



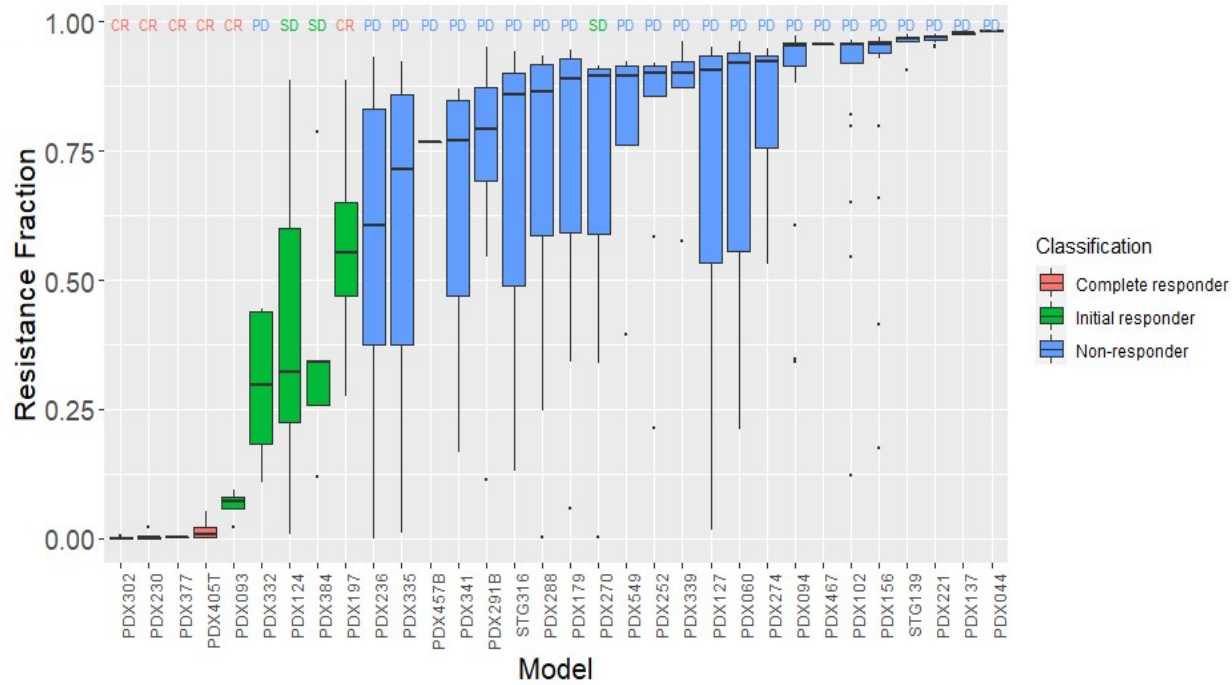
**Supplementary Figure 3.** Conditional weighted residuals vs time. Conditional weighted residuals versus time for the olaparib monotherapy resistance model. The residual must be centred around zero and show no visible trend in order to satisfy the assumptions made by the NLME framework. That is satisfied initially the fitting apparently becomes progressively worse for higher tumour volumes and later time points but this is attributed to drop-out, which is the removal of mice from the study when the tumour has grown above the welfare limit .



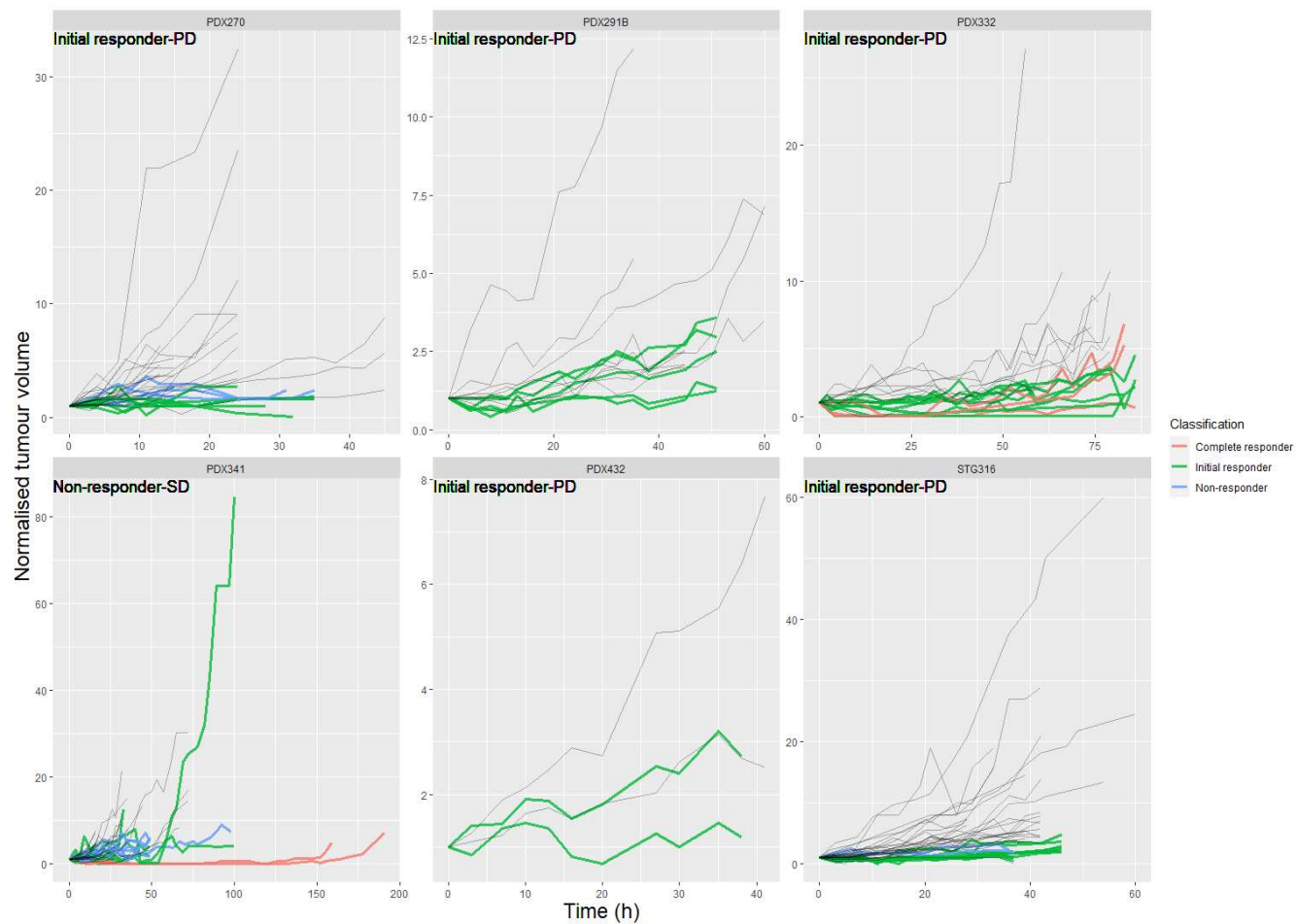
**Supplementary Figure 4.** Observations vs individual predictions (IPRED). Tumour volume data (observations) versus predicted values for each individual for the olaparib monotherapy resistance model. The black solid line represents the unity line and hence the agreement between the data and the volumes simulated from the models taking into account the residuals and variability of the parameters.



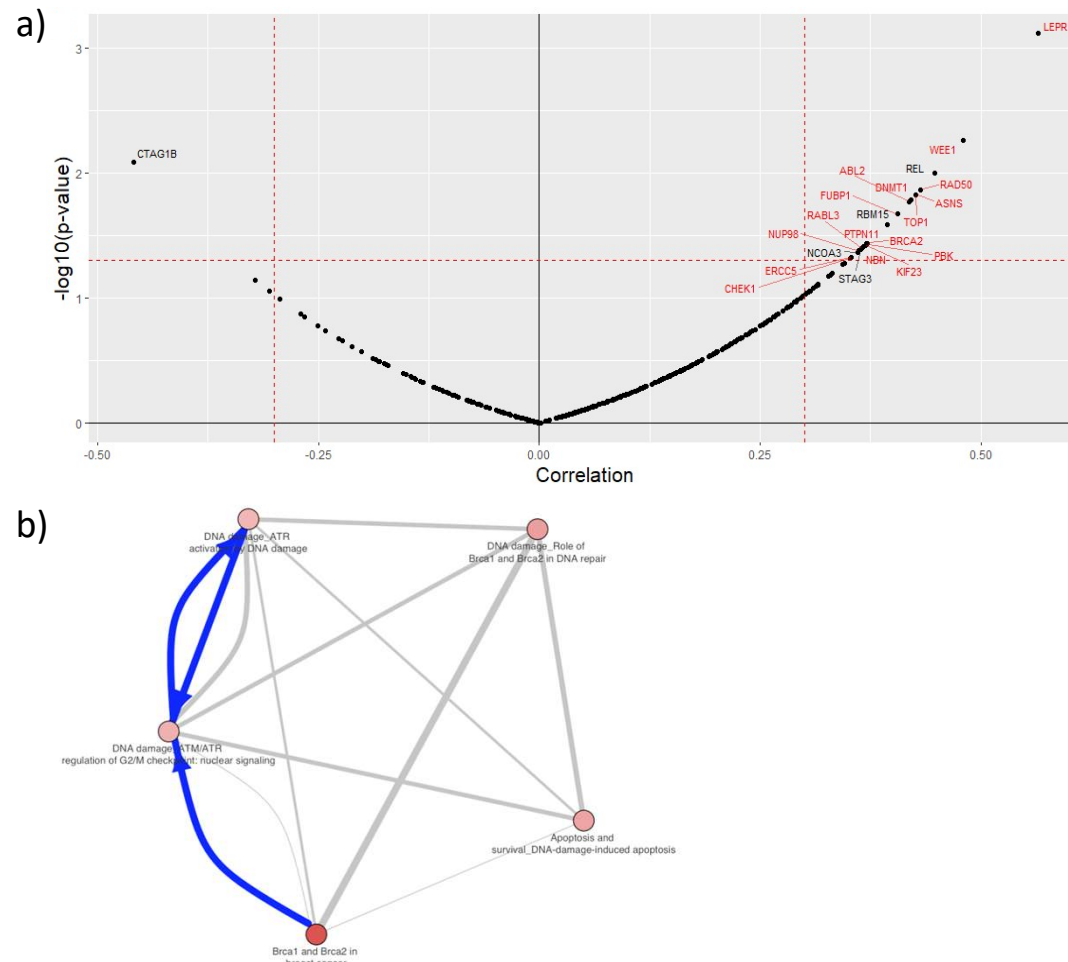
**Supplementary Figure 5.** Resistance fraction variability per mouse per PDX. Variability of the resistance fraction estimated for each mouse for each PDX in the 100 NONMEM runs. The boxplots are completely flat demonstrating the stability of the parameter estimation and the fact that the variability seen within the PDXs is due to resistance fraction variability between different mice instead of between different runs.



**Supplementary Figure 6.** Continuous and discrete Olaparib 50 mg/kg response of TNBC PDXs. Resistance fraction boxplots with median, min, max and upper and lower quartiles. mRECIST classification is found at the top of each boxplot representing 3 distinct categories: complete responders (CR), stable disease (SD) and progressive disease (PD) and colours represent the mathematical model classification into complete responders (red), initial responders (green) and non-responders (blue).

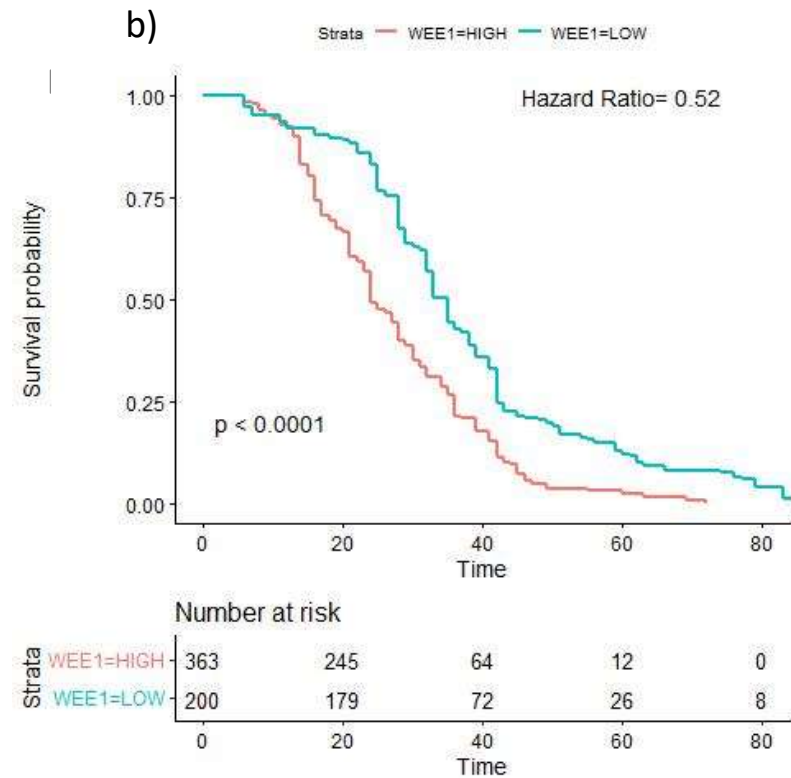
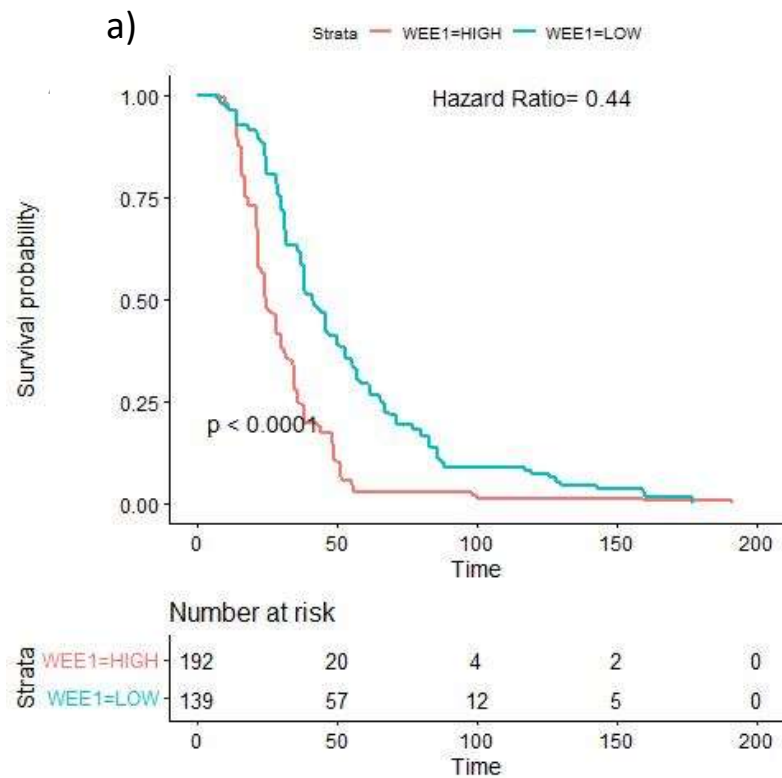


**Supplementary Figure 7.** MRECIST vs model classification olaparib 100 mg/kg. PDX models that have been classified differently using the MRECIST criteria and the model classification using the resistance fraction for olaparib 100 mg/kg monotherapy. Top left corner shows model classification vs MRECIST. Colour represent individual mice tumour classifications within each PDX. Classification for the model is decided through consensus (majority group) between the individual mice classification. Y-axis is the tumour volume normalised by the initial tumour volume.

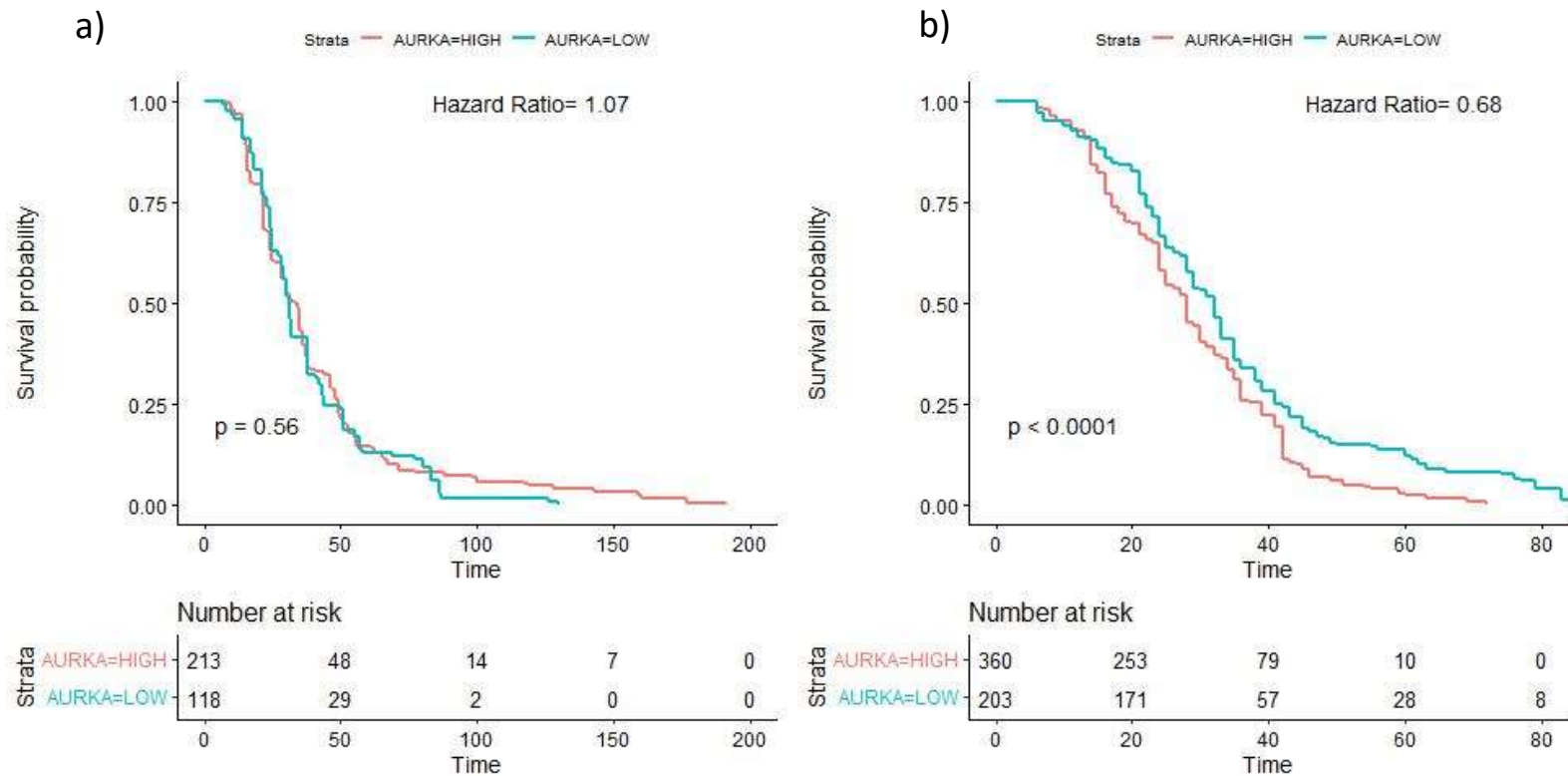


**Supplementary Figure 8.** Resistance correlation markers and enriched ontology terms. **a)** olaparib 50 mg/kg markers where Y-axis is the log transformed p-value with the threshold at  $p=0.05$ . The X-axis is the Pearson's correlation  $\rho$  with a threshold of 0.03 and -0.03. Highlighted in red are the markers found in both doses. **b)** Crosstalk analysis of olaparib 50 mg/kg hits: The network of the top 5 ontology terms from pathway enrichment analysis is depicted. Nodes represent top terms and edges represent significant similarities (as measured by hypergeometric test) between these entities. The edge thickness depends on the size of intersection between two ontology terms while the color of the node corresponds to the enrichment z-score.

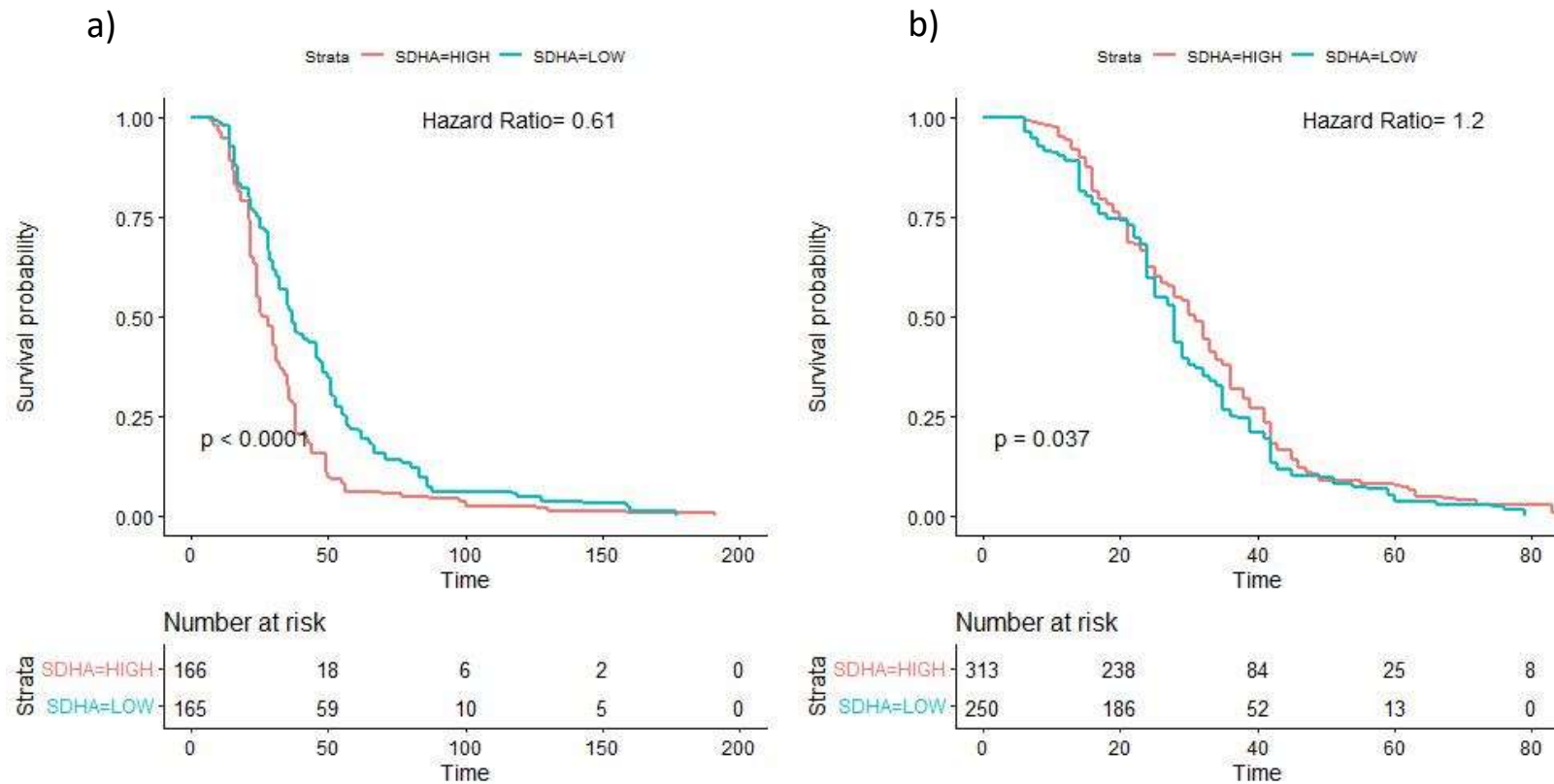




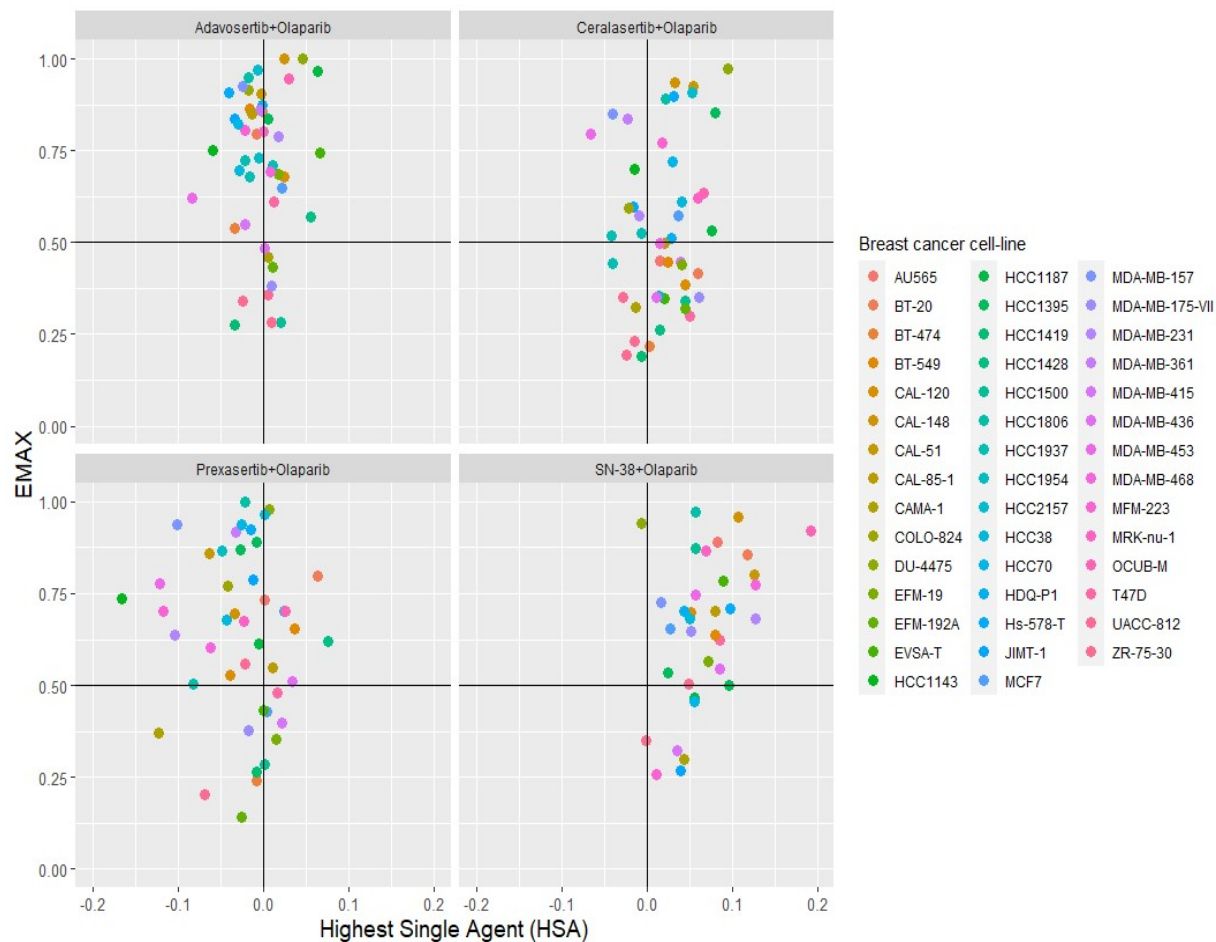
**Supplementary Figure 9.** WEE1 expression Kaplan-Meier plot for treated and untreated mice. Survival Kaplan-Meier curve for the treated and untreated mice based on median WEE1 expression. Low indicates PDXs with WEE1 expression less than the population median and HIGH inversely. A p-value  $< 0.05$  shows a significant separation between the two curves. Hazard ratio quantifies the difference between the two WEE1 expression groups. In this case less than 1 signifies less risk for LOW WEE1 and more than 1 less risk for HIGH WEE1 group respectively. **a)** Treated mice group shows an improvement in survival for LOW WEE1 expression. **b)** Untreated mice group also shows an improvement in survival for the LOW WEE1 mice but with a smaller separation than the untreated group (higher hazard ratio).



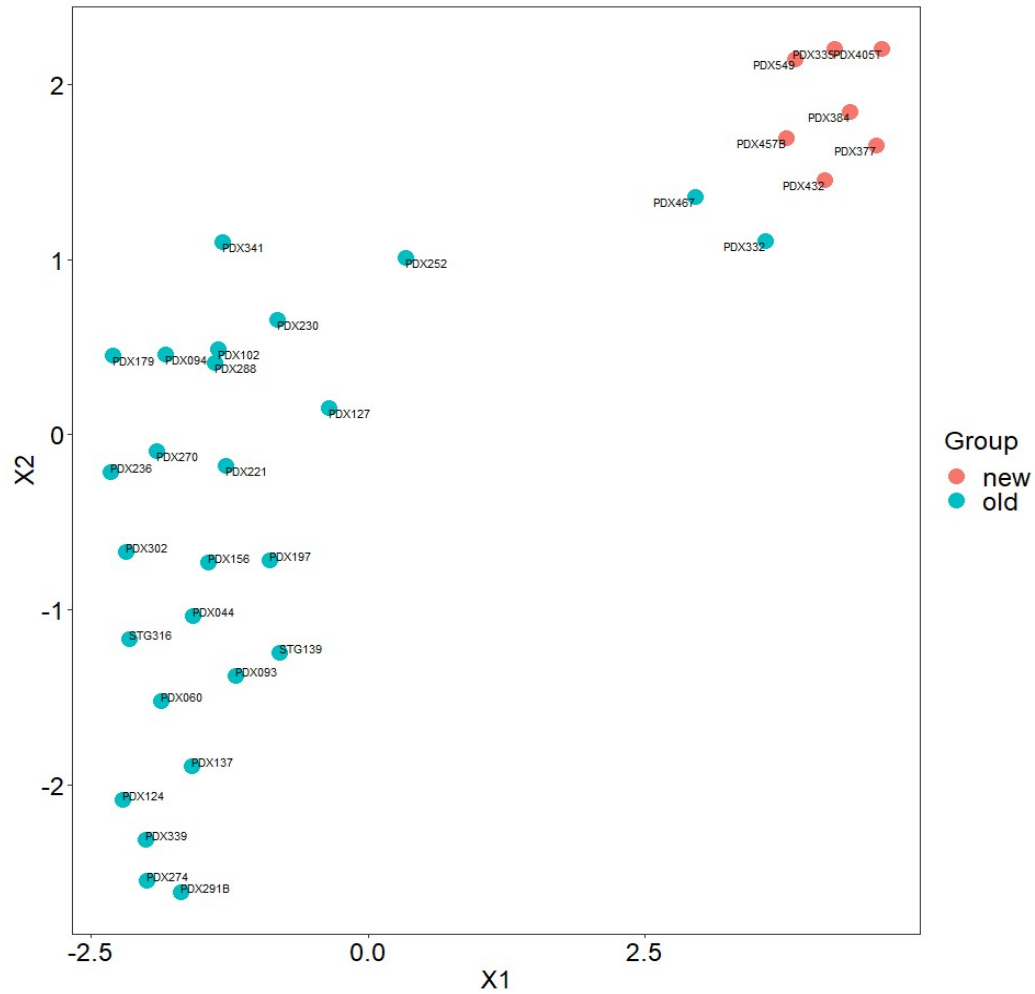
**Supplementary Figure 10.** AURKA expression Kaplan-Meier plot for treated and untreated mice. Survival Kaplan-Meier curve for the treated and untreated mice based on median AURKA expression. Low indicates PDXs with AURKA expression less than the population median and HIGH inversely. A p-value < 0.05 shows a significant separation between the two curves. Hazard ratio quantifies the difference between the two AURKA expression groups. In this case less than 1 signifies less risk for LOW AURKA and more than 1 less risk for HIGH AURKA group respectively. **a)** Treated mice group shows no improvement in survival for HIGH BRCA1 expression. **b)** Untreated mice group shows statistically significant difference in survival between LOW and HIGH AURKA.



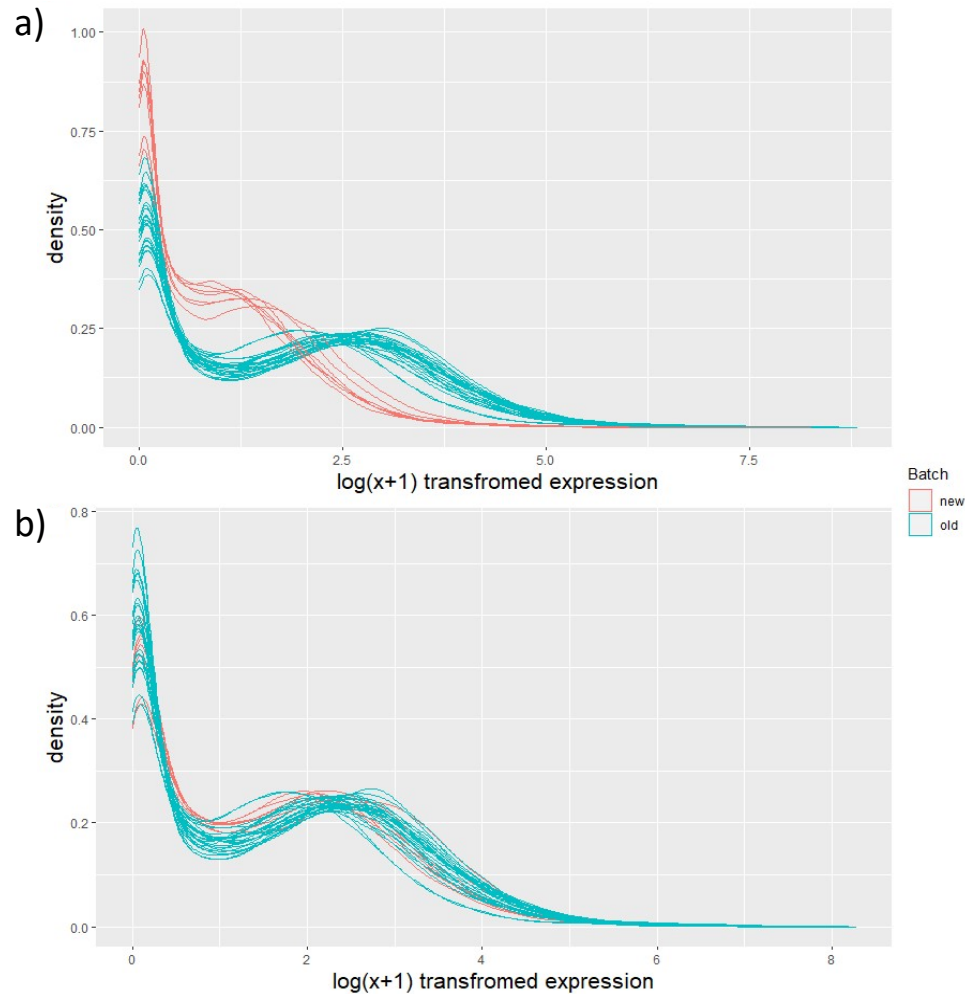
**Supplementary Figure 11.** SDHA expression Kaplan-Meier plot for treated and untreated mice. Survival Kaplan-Meier curve for the treated and untreated mice based on median SDHA expression. Low indicates PDXs with SDHA expression less than the population median and HIGH inversely. A p-value  $<0.05$  shows a significant separation between the two curves. Hazard ratio quantifies the difference between the two CTAG1B expression groups. In this case less than 1 signifies less risk for LOW SDHA and more than 1 less risk for HIGH SDHA group respectively, **a)** SDHA mice group shows an improvement in survival for LOW SDHA expression. **b)** Untreated mice group shows no improvement in survival for the HIGH SDHA mice opposite to the treated group.



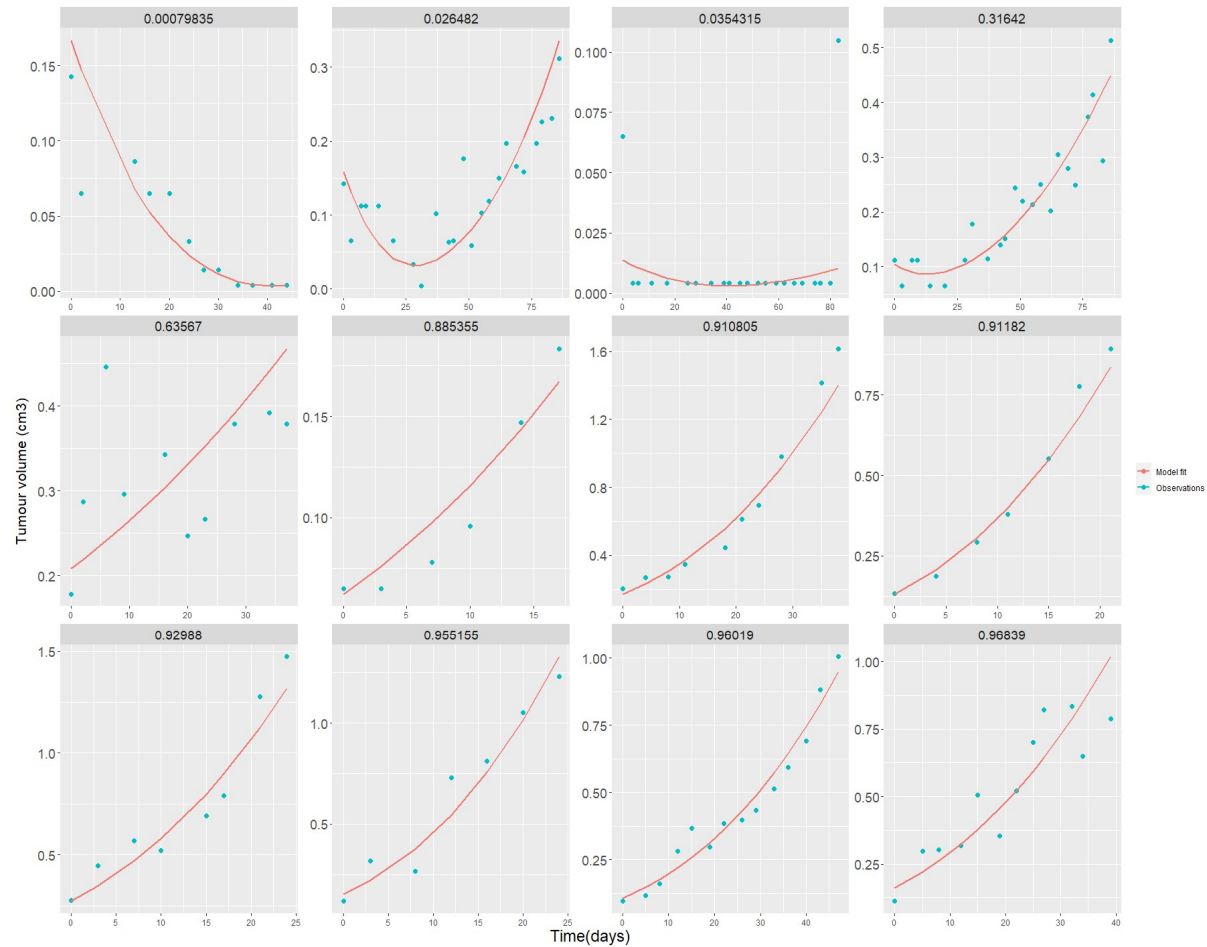
**Supplementary Figure 12.** *in vitro* validation experiments for Olaparib in vitro combination studies for top four resistance biomarkers – WEE1 (Adavosertib), ATR (Ceralasertib), CHK1/2 (Prexasertib), and TOP1 (SN-38), across 44 Breast Cancer cell lines. The scatterplots of EMAX vs Highest Single Agent comparing combination efficacy with synergy shows high synergy and combination efficacy for Olaparib + SN-38 as evidenced by the number of cell lines in the high EMAX-high HAS quadrant, whilst the other three combinations show high response but relatively low synergy, suggesting that actionable and selective synergy can be identified by this comparison.



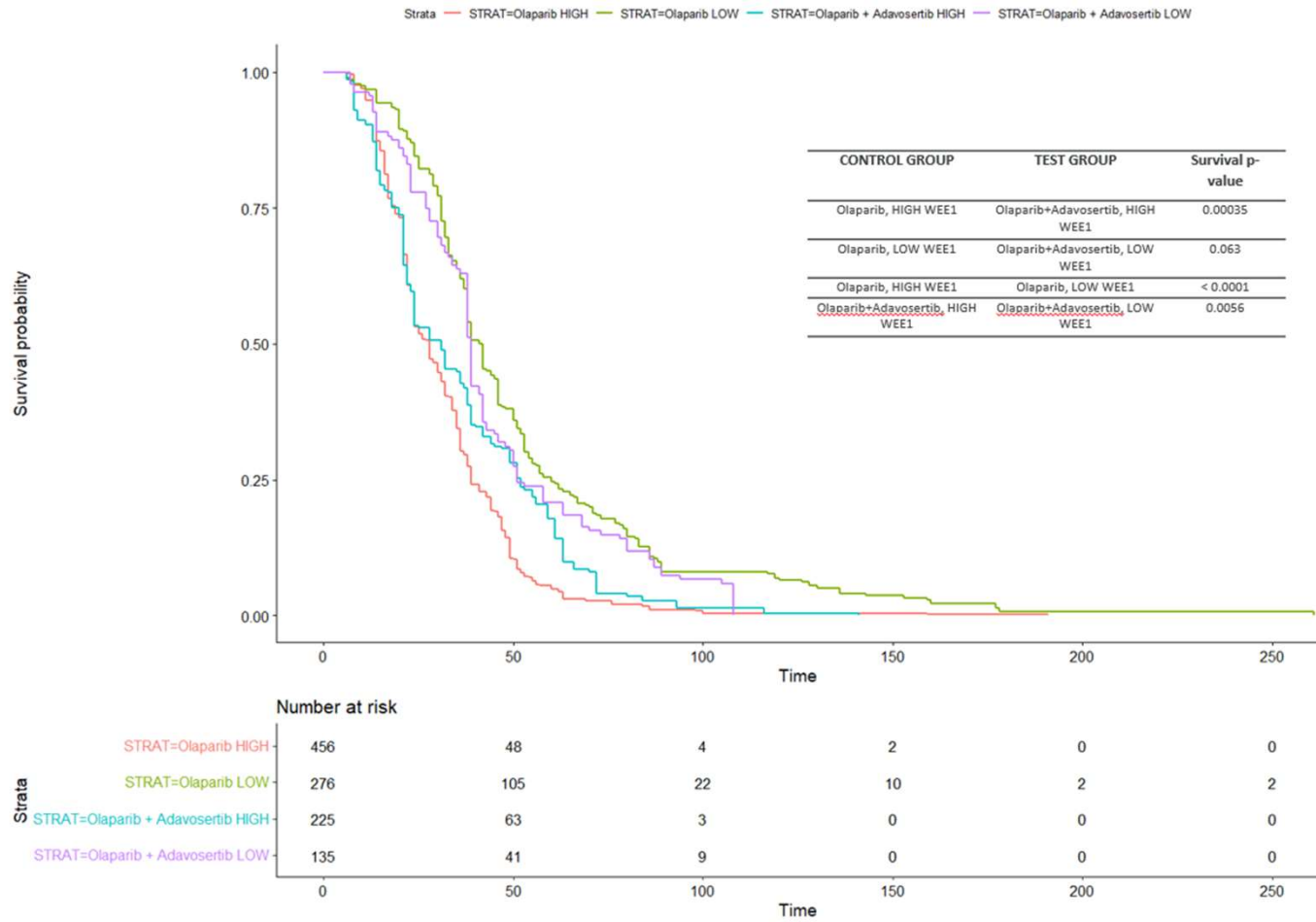
**Supplementary Figure 13.** UMAP of mRNA expression. Uniform Manifold Approximation and Projection (UMAP) dimensionality reduction and clustering for mRNA data of PDX triple negative breast cancer cohort in two dimensions X1 and X2. Colours are assigned based on the two batches that the PDXs were sequenced. With the exception of PDX457 and PDX332 there is a clear separation between the “old” and “new” batch. Batch correction is necessary to compare expression between PDXs.



**Supplementary Figure 14.** LOG( $x+1$ ) transformed expression before and after ComBat correction. The colour represents the batch the PDXs was sequenced **a)** LOG( $X+1$ ) transformed data mRNA data for all TNBC PDXs before batch corrections. A separation between the expression profiles is visible between the two batches. **b)** LOG( $X+1$ ) transformed data mRNA data for all TNBC PDXs after ComBat batch corrections. No separation between the expression profiles is visible between the two batches

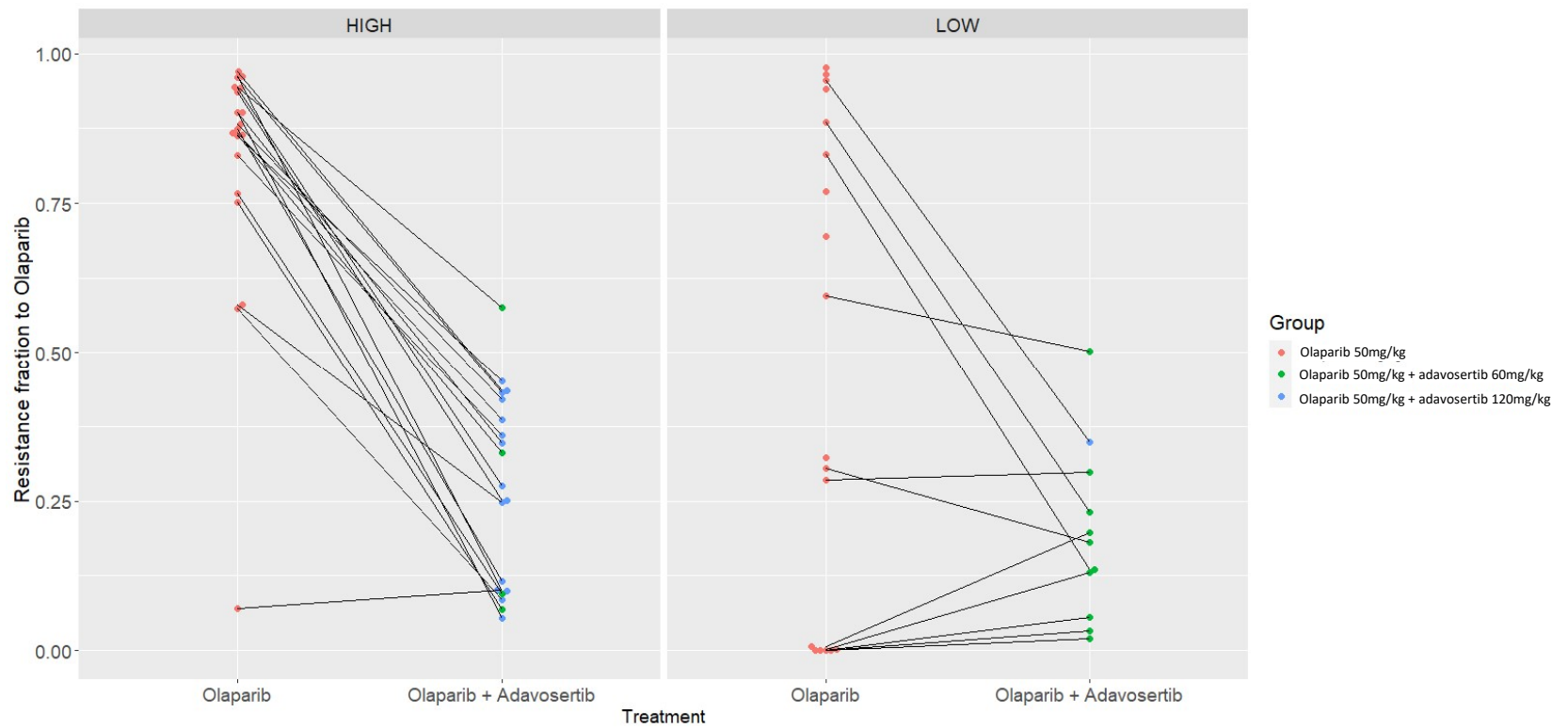


**Supplementary Figure 15.** Observations vs individual predictions for selected IDs. Blue dots represent the data (observations) and the red line is the model fit. The data demonstrate all three types of response (complete, non-response and initial followed by relapse) and the model is able to capture it. The resistance fraction (Fr) value is shown on the top of each box.

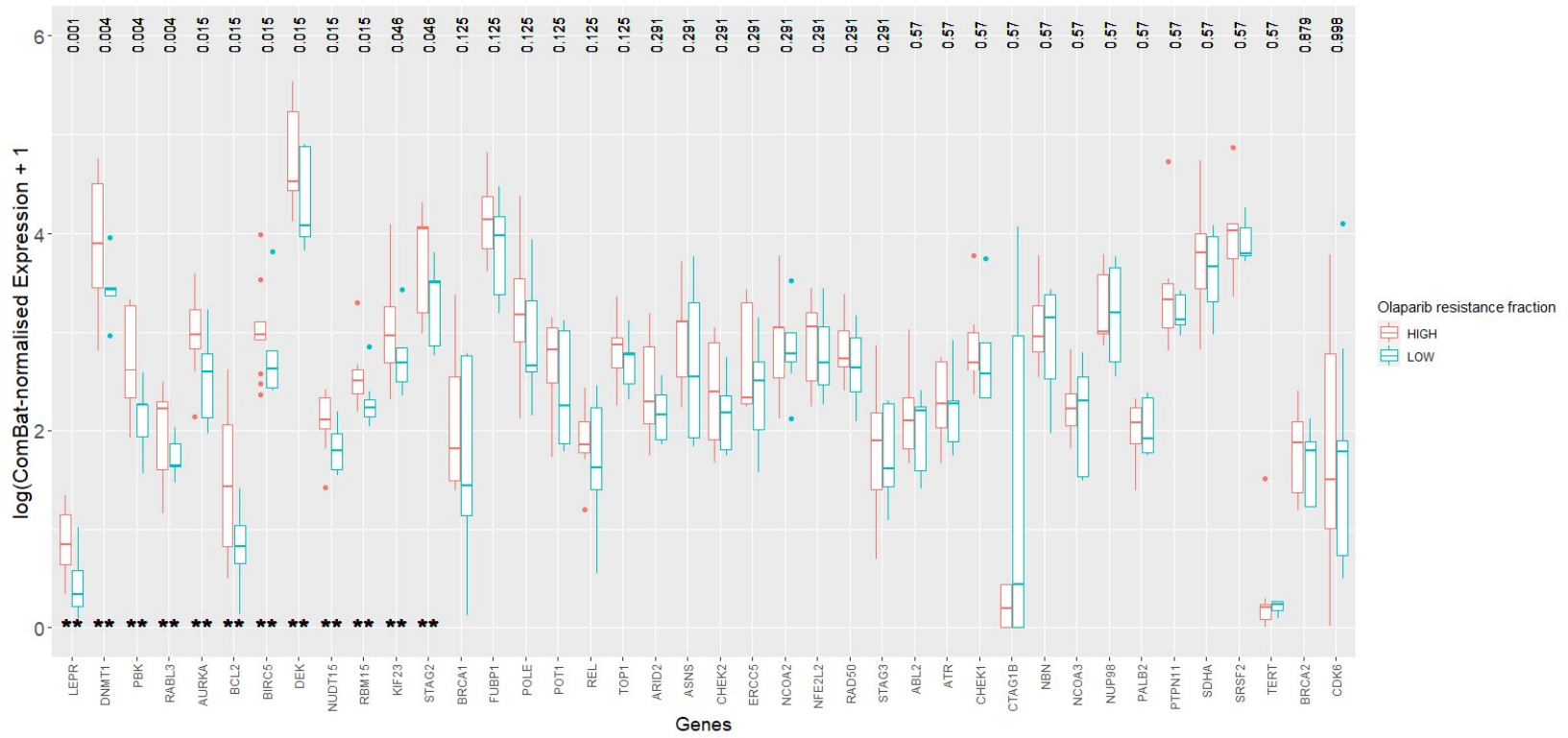


**Supplementary Figure 16.** Kaplan-Meier survival plots stratified by treatment and WEE1 expression levels. Olaparib single agent and combination with adavosertib are compared against each other for LOW and HIGH WEE1 expression levels in addition to the single agent and combination survivability being compared to itself for different WEE1 expression levels.

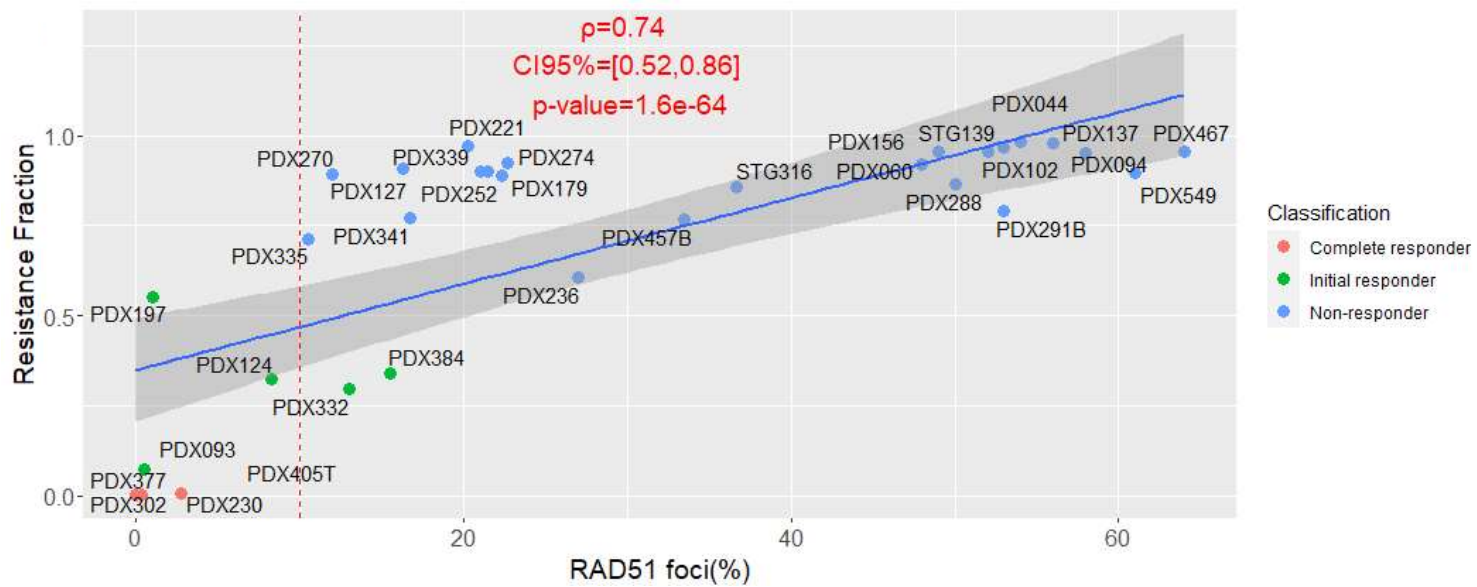




**Supplementary Figure 17.** Effect of *WEE1* expression on olaparib and adavosertib resistance fractions. Facets represent expression levels of *WEE1* with respect to the median expression value in the cohort of PDXs. Individual point colour specifies treatment group. Lines connect same PDXs in the different groups **A**. Resistance fraction of adavosertib is stratified with respect to *WEE1* expression levels for adavosertib single agent. **B**. Resistance fraction of olaparib is stratified with respect to *WEE1* expression levels for olaparib single agent and adavosertib combination. Also separated by dose for either drug.



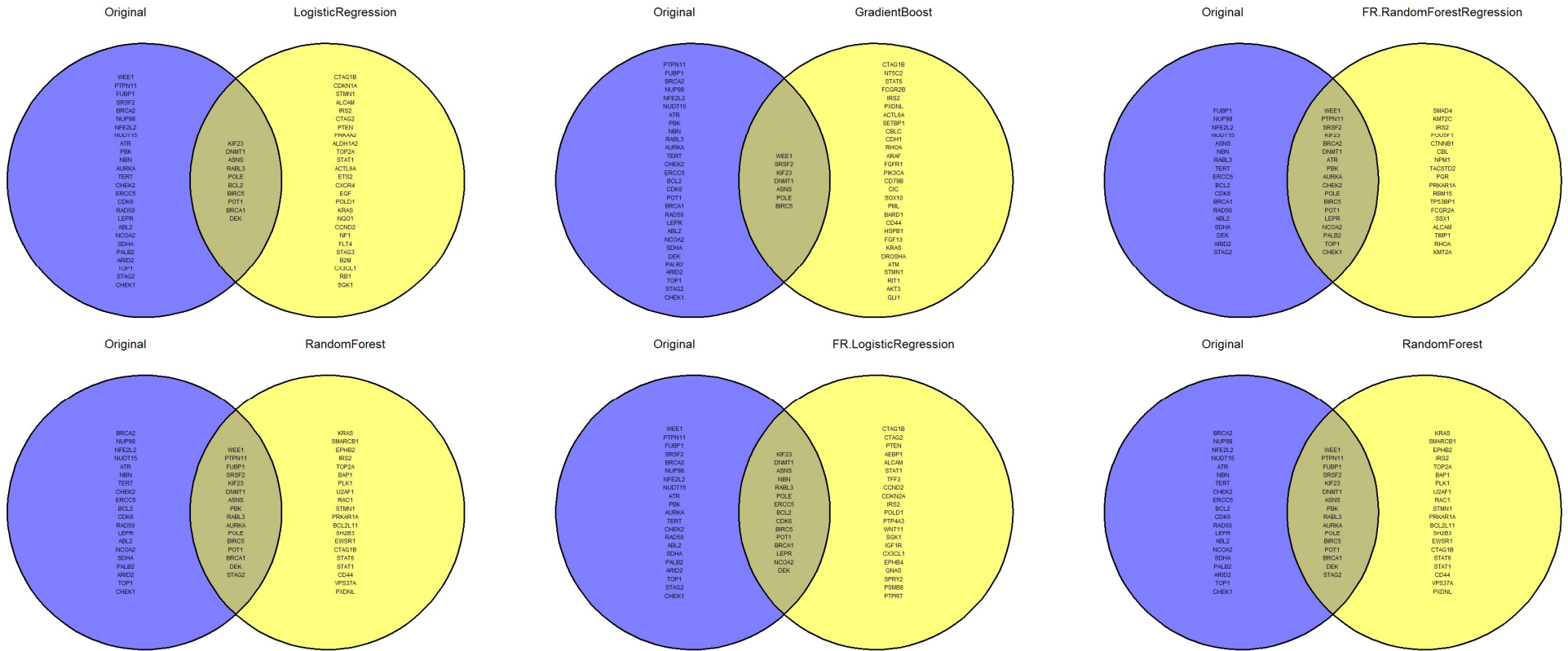
**Supplementary Figure 18.** Gene expression group by olaparib resistance fraction in low-WEE1 PDXs. \*\* represents statistically significant differences in expression as tested using Kolmogorov-Smirnov test (p-value < 0.05). Markers are order by ascending p-value seen on the top of the plot.



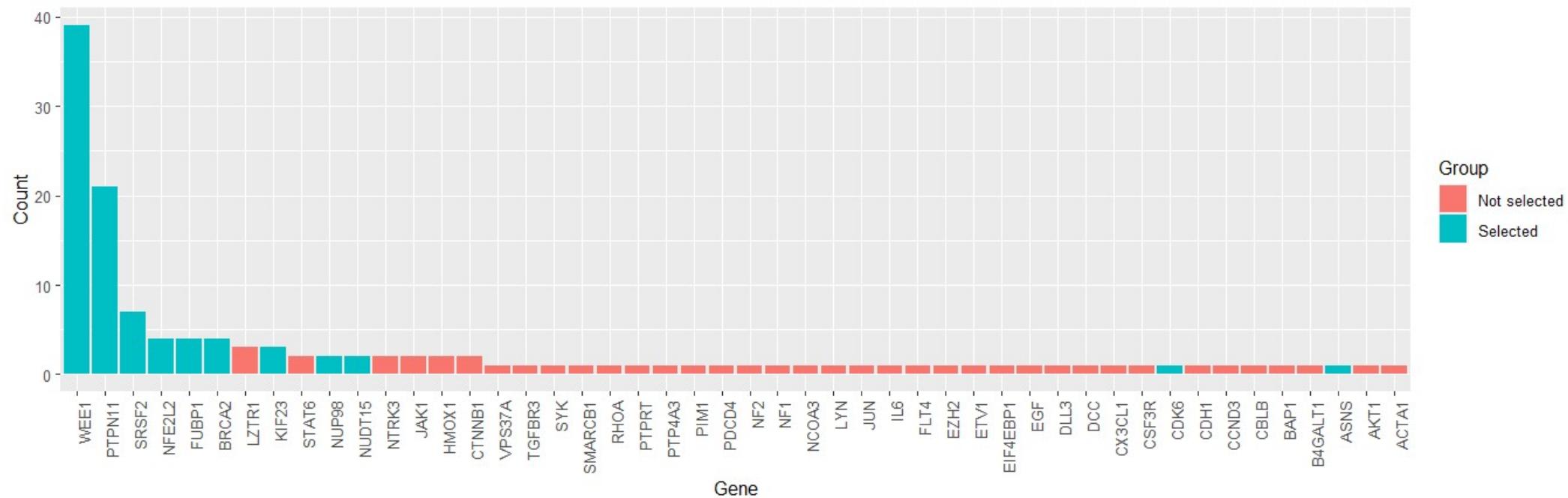
**Supplementary Figure 19.** Pearson's correlation of resistance fraction to RAD51 foci score for Olaparib 50 mg/kg. Colour assigned by classification using the resistance model. Pearson's  $\rho$  value, 95% confidence intervals and p-value are included. Red dotted line corresponds to the 10% threshold for differentiating PARPi-sensitive from PARPi-resistant.



**Supplementary Figure 20.** Responder vs non-responder distribution of selected genes. Non-responders corresponds to PDXs classified as progressive disease (PD) based on the modified RECIST criteria and responders to complete response (CR) or stable disease (SD). Significant difference between the mean of the two distributions for each gene is tested using the Mann-Whitney U test and denoted by \*\* next to the name of the gene.



**Supplementary Figure 21.** Biomarker selection using the original linear correlation vs various ML methods. 36 markers were identified as significant using the linear correlation and to that end for each ML feature selection method we kept the top 36 marker based on weight/importance. Many markers are shared between the simple correlation and the ML methods with markers such as BIRC5, KIF23, DNMT1 and POLE being common in all methods and WEE1 included as one of the top features in 4/6 ML methods. Random forest methods and methods that use the continuous metric of resistance fraction (FR) as output share more common markers with the correlation.



**Supplementary Figure 22.** Bar plot of common genes between train and test sets for 100 splits. The 27 unique expression profiles (PDXs) treated with olaparib 100 mg/kg were split into train (18) and test (9) sets randomly 100 times. The mRNA expression of the CIVIC genes was correlated to the Resistance Fraction and significant genes selected according to p-value ( $<0.05$ ). The count represents the number of times a gene was found as significant in both the train and test split for each of the 100 splits. The colour represents the selected genes, i.e. the ones that were found to be significant in the original correlation analysis with all 27 PDXs (blue) and the ones that were not found to be significant (red).

Parameter	Definition	Value	RSV(%)
$THETA_K$	Fixed effect for growth rate	0.0408	4.2
$THETA_{50}$	Fixed effect for olaparib 50 mg/kg	0.2939	4.4
$THETA_{100}$	Extra fixed effect for olaparib 100 mg/kg	0.2127	10.9
$THETA_{fr}$	Fixed effect for resistance fraction	1.494	14.2
$THETA_{V0}$	Fixed effect for baseline tumour volume	0.136	1.5
$\omega_K$	Random effect for growth rate	0.64	9.4
$\omega_{fr}^{ID}$	Random effect for resistance fraction individual level	2.846	8.2
$\omega_{fr}^{PDX}$	Random effect for resistance fraction PDX level	3.368	69.8
$\omega_{V0}$	Random effect for baseline tumour volume	0.684	5.2

**Supplementary Table 1.** Estimated parameter for Olaparib monotherapy resistance model.

Parameter	Definition	Value	RSV(%)
$THETA_{60}$	Fixed effect for adavosertib 60 mg/kg	-0.3898	4.8
$THETA_{extra}$	Extra fixed effect for adavosertib 120 mg/kg	1.536	11.2
$THETA_{fr}^{olaparib}$	Fixed effect for resistance fraction of olaparib	-1.295	15.1
$THETA_{fr}^{adavosertib}$	Fixed effect for resistance fraction of adavosertib	-0.5529	12.5
$\omega_{fr}^{adavosertib\_ID}$	Random effect for adavosertib resistance fraction individual level	0.9098	7.4
$\omega_{fr}^{adavosertib\_PDX}$	Random effect for adavosertib resistance fraction PDX level	0.7135	62.3
$\omega_{fr}^{olaparib\_ID}$	Random effect for olaparib resistance fraction individual level	0.9028	8.8
$\omega_{fr}^{olaparib\_PDX}$	Random effect for olaparib resistance fraction PDX level	1.089	68.7

**Supplementary Table 2.** Estimated parameter for combination and adavosertib monotherapy resistance model.



#	Maps	Total	p-value	FDR	In Data	Network Objects from Active Data
1	BRCA1 and BRCA2 in breast cancer	19	1.565E-08	2.660E-06	4	CHEK1, NBN, BRCA2, RAD50
2	DNA damage_Role of BRCA1 and BRCA2 in DNA repair	30	1.243E-05	1.056E-03	3	NBN, BRCA2, RAD50
3	DNA damage_ATM/ATR regulation of G2/M checkpoint: nuclear signaling	45	4.280E-05	2.425E-03	3	CHEK1, WEE1, DNMT1
4	DNA damage_ATR activation by DNA damage	53	7.011E-05	2.980E-03	3	CHEK1, NBN, RAD50
5	Apoptosis and survival_DNA-damage-induced apoptosis	15	2.354E-04	8.004E-03	2	CHEK1, NBN
6	Cell cycle_Role of 14-3-3 proteins in cell cycle regulation	22	5.146E-04	1.458E-02	2	CHEK1, WEE1
7	Cell cycle_Role of SCF complex in cell cycle regulation	29	8.986E-04	2.182E-02	2	CHEK1, WEE1
8	Signal transduction_Leptin signaling via JAK/STAT and MAPK cascade	39	1.625E-03	3.391E-02	2	LEPR, PTPN11
9	Breast cancer (general schema)	41	1.795E-03	3.391E-02	2	LEPR, BRCA2
10	Canonical Leptin pathways in breast cancer	47	2.353E-03	4.001E-02	2	LEPR, PTPN11

**Supplementary Table 3.** Enrichment pathway maps-olaparib 50mg/kg

#	Maps	Total	p-value	FDR	In Data	Network Objects from Active Data
1	BRCA1 and BRCA2 in breast cancer	19	9.030E-12	3.413E-09	6	CHEK1, NBN, ATR, BRCA2, RAD50, BRCA1
2	DNA damage_ATM/ATR regulation of G2/M checkpoint: nuclear signaling	45	3.397E-11	6.420E-09	7	CHEK1, ATR, BRCA1, WEE1, PALB2, DNMT1, CHEK2
3	DNA damage_Role of BRCA1 and BRCA2 in DNA repair	30	1.933E-10	2.435E-08	6	NBN, ATR, BRCA2, RAD50, BRCA1, CHEK2
4	Apoptosis and survival_DNA-damage-induced apoptosis	15	4.113E-10	3.887E-08	5	CHEK1, NBN, ATR, BRCA1, CHEK2
5	DNA damage_DNA-damage-induced responses	9	6.903E-09	5.219E-07	4	CHEK1, ATR, BRCA1, CHEK2
6	DNA damage_ATM/ATR regulation of G2/M checkpoint: cytoplasmic signaling	51	2.990E-07	1.883E-05	5	CHEK1, AURKA, ATR, BRCA1, CHEK2
7	Cell cycle_Role of 14-3-3 proteins in cell cycle regulation	22	3.904E-07	2.108E-05	4	CHEK1, ATR, WEE1, CHEK2
8	DNA damage_p53 activation by DNA damage	60	6.824E-07	3.224E-05	5	CHEK1, ATR, BRCA1, BCL2, CHEK2
9	DNA damage_BRCA1 as a transcription regulator	30	1.439E-06	5.439E-05	4	TERT, ATR, BRCA1, CHEK2
10	DNA damage_G2 checkpoint in response to DNA mismatches	30	1.439E-06	5.439E-05	4	CHEK1, ATR, BRCA1, CHEK2

**Supplementary Table 4.** Enrichment pathway maps-olaparib 100mg/kg

PDX	P/M	Previous treatment	Cancer subtype	HRR gene	cDNA change	AA change	Domain	Variant effect	CNV	BRCA1 promoter hypermethylation	RAD51 foci
PDX044	M	T	TNBC								54
PDX060	M	T	TNBC								48
PDX093	P	N	TNBC	PALB2	c.886dupA	p.M296fs	Non recognized domain region	Frameshift			0.5
PDX094	P	T	TNBC								58
PDX102	P	N	TNBC								52
PDX124	M	T	TNBC	BRCA1	c.1961delA	p.K654fs	Exon 11	Frameshift			8.3
PDX127	M	T	TNBC	BRCA1	c.185delAG	p.E23fs	Ring	Frameshift			16.3
PDX137	M	T	TNBC								56
PDX156	M	T	TNBC								49
PDX179	M	T	TNBC	BRCA1	c.185delAG	p.E23fs	Ring	Frameshift			22.3
PDX197	P	T	TNBC	BRCA1						Yes	1
PDX221	P	T	TNBC	BRCA1	c.5027delT	p.L1676fs	BRCT	Frameshift			20.3
PDX230	P	T	TNBC	BRCA1	c.185delAG	p.E23fs	Ring	Frameshift			0.3
PDX236	M	T	TNBC	BRCA1	c.5194-12G>A		Intronic variant	Splicing			27
PDX252	M	T	TNBC	BRCA1	c.5123C>A	p.A1708E	BRCT	Missense			21.5
PDX270	P	N	TNBC	BRCA1						Yes	12
PDX274	M	T	TNBC	BRCA1					Homoloss		22.7
PDX288	M	T	TNBC								50
PDX291B	M	T	TNBC								53
PDX302	M	T	TNBC	BRCA1						Yes	0
PDX332	M	T	TNBC		c.7796A>G	p.E2599G	DNA binding (Helical domain)	Missense			13
PDX335	M	T	TNBC	BRCA2	c.7796A>G	p.E2599G	DNA binding (Helical domain)	Missense			10.5
PDX339	M	T	TNBC	BRCA1	c.211A>G	p.R71G	Ring	Missense			21
PDX341	M	T	TNBC	BRCA1	c.2404delGA	p.R762fs	Exon 11	Frameshift			16.7
PDX377	M	T	TNBC	BRCA1	c.1912delG	p.E638fs	Exon 11	Frameshift			0
PDX384	M	T	TNBC	BRCA1	c.791-794delGTTC	p.S264Mfs*33	Exon 11	Frameshift			15.5
PDX405T	M	T	TNBC	BRCA2	c.5909C>A	p.S1970*	Non recognized domain region	Nonsense			2.7
PDX432	M	T	TNBC								4.5
PDX457B	M	T	TNBC								33.5
PDX467	P	T	TNBC								64
PDX549	P	T	TNBC								61
STG139	P	T	TNBC								53
STG316	P	T	TNBC	BRCA1	c.134+3A>C		Intronic variant	Splicing			36.7

**Supplementary Table 5.** Clinical and molecular characteristics of PDX cohort. Clinical characteristics of PDXs used in the study including RAD51 foci, previous treatment information, mutations. The acronyms are explained in the abbreviations table below.

<b>Term</b>	<b>Abbreviation</b>
Primary	P
Metastatic	M
Treated	T
Naïve	N
Triple Negative Breast Cancer	TNBC
Ovarian Cancer	OvC
Estrogen receptor-positive	ER+
Pancreatic Cancer	PaC
Homologous recombination repair	HRR
complementary DNA	cDNA
Aminoacid	AA
Copy number variant	CNV
messenger RNA	mRNA
AstraZeneca	AZ
Non-available	NA

Gene											
ALK	RET	ABL2	CRKL	FANCA	HSPB1	NEDD9	PTPRB	TGFA	AKT3	FOXP3	ARID2
AKT1	RUNX1	ACTA1	CSF1	FANCC	IGF1R	NF1	PTPRD	TGFBR3	BCL2L11	CRBN	FLCN
ARAF	SF3B1	ACTL6A	CSF3R	PTK2B	IL2RB	NF2	PTPRF	THBS2	SH2B3	DDX41	RICTOR
ABL1	TP53	ACVR1	CTAG1B	FCGR2A	IL6	NFE2L2	RAC1	TIMP1	RAD50	SUFU	RABL3
BRAF	TSC1	PARP1	CCN2	FCGR2B	IL7R	NOTCH3	RAD23B	TMPRSS2	SPRY2	CDK12	ATXN1L
BRCA1	TSC2	AEBP1	CTLA4	FCGR3A	CXCL10	NT5E	RAD51D	TOP1	MAEA	RSF1	MIR21
BRCA2	U2AF1	AKT2	CTNNB1	FGF2	JAK1	NTRK1	RAF1	TOP2A	TUBB3	LRP1B	MIR218-1
CCND1	WT1	ALCAM	CYP2D6	FGF3	JAK3	NTRK2	RASA1	TP53BP1	YAP1	ERRFI1	ECSCR
CCND2	NOTCH1	BIRC3	DBI	FGF13	JUN	NTRK3	RB1	TPT1	MERTK	ROBO4	KLLN
CCND3	DDR2	BIRC5	DCC	FGFR1	KDR	NUP98	RELA	TSPYL1	HOXB13	UGT1A1	DUX4
CCNE1	MET	AREG	GADD45A	FGFR4	KRT18	PRKN	RHEB	TYMS	NCOA2	BCOR	PRNCR1
CDK6	FLI1	RHOA	DDIT3	FOXC2	LAG3	PAX5	RIT1	UGT1A	AGR2	NUDT15	
CDK4	EWSR1	ASCL1	DEFA1	FOXO1	STMN1	PCNA	ROS1	KDM6A	SLCO1B1	FBXW7	
CDKN2A	TET2	ASNS	NQO1	FOXO3	LEPR	PDGFB	RPS6	VEGFA	DLL3	DDX43	
CEBPA	FOXP1	ASS1	DNMT1	FLT4	LYN	PDGFRB	RRM1	VEGFC	STAG3	WDR12	
PRKACA	REL	ATR	DPYD	FNTB	TACSTD2	ABCB1	RRM2	WEE1	STAG2	PBK	
DNMT3A	VHL	ATRX	DRD5	FOS	EPCAM	PIM1	SCN8A	WNT11	HSPH1	POLE4	
EGFR	BCL2	AXL	DUSP6	MTOR	MDM2	PIK3R1	CX3CL1	XRCC1	TLK2	CIP2A	
ERBB2	IGF2	B2M	EFNA2	GAS6	MDM4	PIK3R2	SDHA	CXCR4	PTPRT	KMT2C	
ESR1	AURKA	BARD1	EGF	GATA1	MEN1	PLCG2	SDHB	DEK	PTP4A3	PAPPA2	
FGFR2	PBRM1	PRDM1	EIF1AX	B4GALT1	MITF	PLK1	SRSF2	HMGA2	CHEK2	PBLD	
FGFR3	EZH2	CALR	EIF4EBP1	GLI1	MKI67	PMS2	SGK1	LZTR1	DKK1	CRLF2	
FLT3	KMT2D	CASP8	EP300	GNA11	MLH1	POLD1	SMARCB1	ZRSR2	NT5C2	RBM15	
GATA2	BTK	CBFA2T3	EPAS1	GNAQ	KMT2A	POLE	SMO	KDM5C	CIC	BIRC7	
IDH1	APC	CBFB	EPHB2	GNAS	MMP2	POU5F1	SOX10	ARID1A	DICER1	PALB2	
IDH2	AR	CBL	EPHB4	GSTP1	MMP9	PRKAA2	SSX1	H3C2	SIRT1	PREX2	
JAK2	ASXL1	CBLB	EPOR	MSH6	MN1	PRKAR1A	SSX2	IRS2	BRD4	PDCD1LG2	
KIT	ATM	CD44	ERBB3	H3-3A	MPL	PRKCB	SSX4	ABCC3	CBLC	NECTIN4	
KRAS	BAP1	CD79B	ERBB4	H3-3B	MRE11	MAPK1	STAT1	CFLAR	PPP1R15A	CARD11	
MAP2K1	ERG	CDH1	ERCC1	HDAC2	MSH2	MAP2K2	STAT3	PROM1	POT1	HAVCR2	
MEF2D	FOXL2	CDK2	ERCC2	HGF	MTAP	MAP2K7	STAT5B	ALDH1A2	WWTR1	ABCC10	
CSF1R	IKZF1	CDK5	EREG	NRG1	MTHFR	PRPS1	STAT6	SPHK1	SETBP1	IL33	
MGMT	NCOA3	CDK9	ERCC5	HIF1A	MYB	PSMB8	SULT1E1	FUBP1	PDCD4	SLFN11	
NPM1	PAX8	CDKN1A	ETS2	HLA-C	MYC	PSMD4	STK11	MBD4	MAGEH1	RCSD1	
NRAS	PGR	CDKN1B	ETV1	HLA-DRA	MYCL	PTCH1	SYK	PTTG1	DROSHA	NAPRT	
PIK3CA	SMAD4	CDKN2B	ETV4	HMOX1	MYCN	PTGS2	ZEB1	ABCG2	TBK1	VPS37A	
PDGFRA	SMARCA4	CDX2	ETV5	HOXD8	MYD88	PTPN6	TEK	KIF23	CD274	PXDNL	
PML	TERT	CHEK1	ETV6	HRAS	MYOD1	PTPN11	NR2F2	CUL7	TLX3	AMER1	
PTEN	TTF1	CREBBP	MECOM	HSPA5	NBN	PTPN12	TFF3	FGF19	CTAG2	DGKH	

**Supplementary Table 6.** CIViV gene list. Genes that have been manually curated through literature based evidence and found to have clinical relevance to cancer in the CIViC knowledgebase.

Gene	Correlation	p-value	Treatment
ABCB1	-0.10037826	0.6184	Olaparib 100mg/kg
ABCB1	0.072366866	0.6939	Olaparib 50mg/kg
ABCC10	0.244916119	0.2182	Olaparib 100mg/kg
ABCC10	0.090973804	0.6205	Olaparib 50mg/kg
ABCC3	0.171434059	0.3926	Olaparib 100mg/kg
ABCC3	0.258294089	0.1535	Olaparib 50mg/kg
ABCG2	0.087860296	0.6630	Olaparib 100mg/kg
ABCG2	0.144784264	0.4292	Olaparib 50mg/kg
ABL1	0.038557546	0.8486	Olaparib 100mg/kg
ABL1	-0.046045393	0.8024	Olaparib 50mg/kg
ABL2	0.408874276	0.0342	Olaparib 100mg/kg
ABL2	0.418876041	0.0170	Olaparib 50mg/kg
ACTA1	-0.069476806	0.7306	Olaparib 100mg/kg
ACTA1	0.008105166	0.9649	Olaparib 50mg/kg
ACTL6A	0.279473536	0.1580	Olaparib 100mg/kg
ACTL6A	0.135117157	0.4609	Olaparib 50mg/kg
ACVR1	0.11314272	0.5742	Olaparib 100mg/kg
ACVR1	0.033625328	0.8550	Olaparib 50mg/kg
AEBP1	-0.213712084	0.2845	Olaparib 100mg/kg
AEBP1	-0.11656011	0.5252	Olaparib 50mg/kg
AGR2	0.062252398	0.7577	Olaparib 100mg/kg
AGR2	0.053860569	0.7697	Olaparib 50mg/kg
AKT1	0.18771811	0.3484	Olaparib 100mg/kg
AKT1	0.25280248	0.1627	Olaparib 50mg/kg
AKT2	0.26744799	0.1774	Olaparib 100mg/kg
AKT2	0.061237019	0.7392	Olaparib 50mg/kg
AKT3	0.034554299	0.8641	Olaparib 100mg/kg
AKT3	-0.080723641	0.6605	Olaparib 50mg/kg
ALCAM	-0.150460641	0.4538	Olaparib 100mg/kg
ALCAM	-0.242316054	0.1815	Olaparib 50mg/kg
ALDH1A2	0.002891127	0.9886	Olaparib 100mg/kg
ALDH1A2	-0.013362614	0.9421	Olaparib 50mg/kg
ALK	-0.18920759	0.3446	Olaparib 100mg/kg

ALK	-0.321676164	0.0726	Olaparib 50mg/kg
AMER1	0.045485577	0.8218	Olaparib 100mg/kg
AMER1	-0.108730702	0.5536	Olaparib 50mg/kg
APC	0.156358531	0.4361	Olaparib 100mg/kg
APC	0.200998561	0.2700	Olaparib 50mg/kg
AR	0.17966393	0.3699	Olaparib 100mg/kg
AR	0.031890462	0.8624	Olaparib 50mg/kg
ARAF	0.024201872	0.9046	Olaparib 100mg/kg
ARAF	-0.139654754	0.4459	Olaparib 50mg/kg
AREG	0.12462526	0.5357	Olaparib 100mg/kg
AREG	0.008311253	0.9640	Olaparib 50mg/kg
ARID1A	0.173342602	0.3872	Olaparib 100mg/kg
ARID1A	0.201993475	0.2676	Olaparib 50mg/kg
ARID2	0.388633851	0.0451	Olaparib 100mg/kg
ARID2	0.29219224	0.1046	Olaparib 50mg/kg
ASCL1	-0.156511411	0.4356	Olaparib 100mg/kg
ASCL1	-0.154547322	0.3984	Olaparib 50mg/kg
ASNS	0.464906018	0.0146	Olaparib 100mg/kg
ASNS	0.426267319	0.0150	Olaparib 50mg/kg
ASS1	-0.073631996	0.7151	Olaparib 100mg/kg
ASS1	-0.076912848	0.6757	Olaparib 50mg/kg
ASXL1	0.146537457	0.4658	Olaparib 100mg/kg
ASXL1	0.096046937	0.6010	Olaparib 50mg/kg
ATM	0.271891911	0.1701	Olaparib 100mg/kg
ATM	0.172813066	0.3442	Olaparib 50mg/kg
ATR	0.469953678	0.0134	Olaparib 100mg/kg
ATR	0.329802867	0.0653	Olaparib 50mg/kg
ATRX	0.254346621	0.2005	Olaparib 100mg/kg
ATRX	0.229608308	0.2062	Olaparib 50mg/kg
ATXN1L	0.09004587	0.6551	Olaparib 100mg/kg
ATXN1L	0.1047737	0.5682	Olaparib 50mg/kg
AURKA	0.445627762	0.0198	Olaparib 100mg/kg
AURKA	0.331675548	0.0637	Olaparib 50mg/kg
AXL	0.114956662	0.5680	Olaparib 100mg/kg

AXL	0.170264753	0.3515	Olaparib 50mg/kg
B2M	-0.019660596	0.9225	Olaparib 100mg/kg
B2M	-0.113573228	0.5360	Olaparib 50mg/kg
B4GALT1	0.211901568	0.2887	Olaparib 100mg/kg
B4GALT1	0.163248389	0.3720	Olaparib 50mg/kg
BAP1	0.168848714	0.3998	Olaparib 100mg/kg
BAP1	-0.010726082	0.9535	Olaparib 50mg/kg
BARD1	0.188700661	0.3459	Olaparib 100mg/kg
BARD1	0.095047199	0.6048	Olaparib 50mg/kg
BCL2	0.424924613	0.0271	Olaparib 100mg/kg
BCL2	0.289727115	0.1077	Olaparib 50mg/kg
BCL2L11	0.337645612	0.0850	Olaparib 100mg/kg
BCL2L11	0.171214549	0.3488	Olaparib 50mg/kg
BCOR	-0.031046454	0.8778	Olaparib 100mg/kg
BCOR	-0.007006121	0.9696	Olaparib 50mg/kg
BIRC3	0.296884914	0.1326	Olaparib 100mg/kg
BIRC3	0.176744865	0.3332	Olaparib 50mg/kg
BIRC5	0.420865755	0.0288	Olaparib 100mg/kg
BIRC5	0.249831998	0.1679	Olaparib 50mg/kg
BIRC7	-0.131195674	0.5142	Olaparib 100mg/kg
BIRC7	-0.068048173	0.7113	Olaparib 50mg/kg
BRAF	0.300436855	0.1278	Olaparib 100mg/kg
BRAF	0.113471627	0.5363	Olaparib 50mg/kg
BRCA1	0.415524603	0.0311	Olaparib 100mg/kg
BRCA1	0.280245813	0.1203	Olaparib 50mg/kg
BRCA2	0.516367911	0.0058	Olaparib 100mg/kg
BRCA2	0.371208469	0.0365	Olaparib 50mg/kg
BRD4	0.160342722	0.4243	Olaparib 100mg/kg
BRD4	0.183375552	0.3151	Olaparib 50mg/kg
BTK	0.291298092	0.1404	Olaparib 100mg/kg
BTK	0.256136564	0.1571	Olaparib 50mg/kg
CALR	0.102659693	0.6104	Olaparib 100mg/kg
CALR	0.060871439	0.7407	Olaparib 50mg/kg
CARD11	0.085506419	0.6715	Olaparib 100mg/kg



CARD11	0.159318851	0.3838	Olaparib 50mg/kg
CASP8	0.115421655	0.5664	Olaparib 100mg/kg
CASP8	-0.097618453	0.5951	Olaparib 50mg/kg
CBFA2T3	0.035613167	0.8600	Olaparib 100mg/kg
CBFA2T3	0.091240854	0.6194	Olaparib 50mg/kg
CBFB	0.228859049	0.2509	Olaparib 100mg/kg
CBFB	0.220587513	0.2251	Olaparib 50mg/kg
CBL	0.35298467	0.0709	Olaparib 100mg/kg
CBL	0.265060965	0.1426	Olaparib 50mg/kg
CBLB	0.246110431	0.2159	Olaparib 100mg/kg
CBLB	0.176931771	0.3327	Olaparib 50mg/kg
CBLC	0.134656824	0.5031	Olaparib 100mg/kg
CBLC	0.13669136	0.4557	Olaparib 50mg/kg
CCND1	0.255935539	0.1976	Olaparib 100mg/kg
CCND1	0.091252872	0.6194	Olaparib 50mg/kg
CCND2	0.270140467	0.1730	Olaparib 100mg/kg
CCND2	0.192200537	0.2919	Olaparib 50mg/kg
CCND3	-0.148412323	0.4600	Olaparib 100mg/kg
CCND3	-0.058972069	0.7485	Olaparib 50mg/kg
CCNE1	0.373633155	0.0549	Olaparib 100mg/kg
CCNE1	0.315183105	0.0789	Olaparib 50mg/kg
CD274	0.155244591	0.4394	Olaparib 100mg/kg
CD274	-0.007707929	0.9666	Olaparib 50mg/kg
CD44	0.244586988	0.2189	Olaparib 100mg/kg
CD44	0.198235133	0.2768	Olaparib 50mg/kg
CD79B	-0.037631434	0.8522	Olaparib 100mg/kg
CD79B	-0.082371245	0.6540	Olaparib 50mg/kg
CDH1	0.202462225	0.3112	Olaparib 100mg/kg
CDH1	0.040586857	0.8254	Olaparib 50mg/kg
CDK12	0.218404992	0.2738	Olaparib 100mg/kg
CDK12	0.236947072	0.1916	Olaparib 50mg/kg
CDK2	0.022354138	0.9119	Olaparib 100mg/kg
CDK2	-0.046918732	0.7987	Olaparib 50mg/kg
CDK4	0.166546487	0.4064	Olaparib 100mg/kg

CDK4	-0.070538438	0.7013	Olaparib 50mg/kg
CDK5	0.125064193	0.5342	Olaparib 100mg/kg
CDK5	-0.005549125	0.9760	Olaparib 50mg/kg
CDK6	0.421397443	0.0286	Olaparib 100mg/kg
CDK6	0.295878725	0.1001	Olaparib 50mg/kg
CDK9	0.135427821	0.5006	Olaparib 100mg/kg
CDK9	0.044768775	0.8078	Olaparib 50mg/kg
CDKN1A	0.079242074	0.6944	Olaparib 100mg/kg
CDKN1A	0.114947088	0.5310	Olaparib 50mg/kg
CDKN1B	0.280502283	0.1564	Olaparib 100mg/kg
CDKN1B	0.135520838	0.4596	Olaparib 50mg/kg
CDKN2A	-0.311759883	0.1134	Olaparib 100mg/kg
CDKN2A	-0.074286513	0.6862	Olaparib 50mg/kg
CDKN2B	-0.206488535	0.3014	Olaparib 100mg/kg
CDKN2B	0.000648753	0.9972	Olaparib 50mg/kg
CDX2	0.143241652	0.4760	Olaparib 100mg/kg
CDX2	0.151517643	0.4078	Olaparib 50mg/kg
CEBPA	0.094731384	0.6384	Olaparib 100mg/kg
CEBPA	0.087472097	0.6340	Olaparib 50mg/kg
CFLAR	0.253574155	0.2019	Olaparib 100mg/kg
CFLAR	0.099832238	0.5867	Olaparib 50mg/kg
CHEK1	0.380987478	0.0499	Olaparib 100mg/kg
CHEK1	0.352169431	0.0481	Olaparib 50mg/kg
CHEK2	0.433872836	0.0238	Olaparib 100mg/kg
CHEK2	0.298319885	0.0972	Olaparib 50mg/kg
CIC	-0.019737319	0.9222	Olaparib 100mg/kg
CIC	-0.018902427	0.9182	Olaparib 50mg/kg
CRBN	0.265293497	0.1811	Olaparib 100mg/kg
CRBN	0.090598715	0.6219	Olaparib 50mg/kg
CREBBP	0.096140416	0.6333	Olaparib 100mg/kg
CREBBP	0.077240195	0.6744	Olaparib 50mg/kg
CRKL	0.107742628	0.5927	Olaparib 100mg/kg
CRKL	0.038120873	0.8359	Olaparib 50mg/kg
CRLF2	0.311638297	0.1136	Olaparib 100mg/kg

CRLF2	0.276024657	0.1262	Olaparib 50mg/kg
CSF1	0.07416627	0.7131	Olaparib 100mg/kg
CSF1	-0.110517388	0.5471	Olaparib 50mg/kg
CSF1R	-0.030133172	0.8814	Olaparib 100mg/kg
CSF1R	-0.03952167	0.8300	Olaparib 50mg/kg
CSF3R	-0.164250924	0.4130	Olaparib 100mg/kg
CSF3R	0.05659527	0.7583	Olaparib 50mg/kg
CTAG1B	-0.358963495	0.0659	Olaparib 100mg/kg
CTAG1B	-0.458765215	0.0083	Olaparib 50mg/kg
CTAG2	-0.320709924	0.1029	Olaparib 100mg/kg
CTAG2	-0.140977865	0.4415	Olaparib 50mg/kg
CTLA4	-0.016587224	0.9346	Olaparib 100mg/kg
CTLA4	0.05827336	0.7514	Olaparib 50mg/kg
CTNNB1	0.353575833	0.0704	Olaparib 100mg/kg
CTNNB1	0.221341491	0.2234	Olaparib 50mg/kg
CUL7	0.126647845	0.5290	Olaparib 100mg/kg
CUL7	0.198334986	0.2765	Olaparib 50mg/kg
CX3CL1	-0.102736916	0.6101	Olaparib 100mg/kg
CX3CL1	-0.082537172	0.6534	Olaparib 50mg/kg
CXCL10	0.114166351	0.5707	Olaparib 100mg/kg
CXCL10	0.08938852	0.6266	Olaparib 50mg/kg
CXCR4	0.212251653	0.2878	Olaparib 100mg/kg
CXCR4	0.038247144	0.8354	Olaparib 50mg/kg
CYP2D6	0.238361383	0.2312	Olaparib 100mg/kg
CYP2D6	0.162428399	0.3744	Olaparib 50mg/kg
DBI	0.045784111	0.8206	Olaparib 100mg/kg
DBI	0.019388092	0.9161	Olaparib 50mg/kg
DCC	-0.127458414	0.5264	Olaparib 100mg/kg
DCC	-0.10231448	0.5774	Olaparib 50mg/kg
DDIT3	0.171617937	0.3920	Olaparib 100mg/kg
DDIT3	-0.032535552	0.8597	Olaparib 50mg/kg
DDR2	-0.038391516	0.8492	Olaparib 100mg/kg
DDR2	-0.188126839	0.3025	Olaparib 50mg/kg
DDX41	0.305696627	0.1210	Olaparib 100mg/kg

DDX41	0.255652736	0.1579	Olaparib 50mg/kg
DDX43	0.133517601	0.5067	Olaparib 100mg/kg
DDX43	0.244066264	0.1782	Olaparib 50mg/kg
DEFA1	0.19400675	0.3322	Olaparib 100mg/kg
DEFA1	0.04258554	0.8170	Olaparib 50mg/kg
DEK	0.404286894	0.0365	Olaparib 100mg/kg
DEK	0.343785872	0.0540	Olaparib 50mg/kg
DGKH	0.279472843	0.1580	Olaparib 100mg/kg
DGKH	0.199867235	0.2728	Olaparib 50mg/kg
DICER1	0.314915656	0.1096	Olaparib 100mg/kg
DICER1	0.164738986	0.3676	Olaparib 50mg/kg
DKK1	0.366497568	0.0601	Olaparib 100mg/kg
DKK1	0.289031478	0.1086	Olaparib 50mg/kg
DLL3	0.005784922	0.9772	Olaparib 100mg/kg
DLL3	0.063237575	0.7310	Olaparib 50mg/kg
DNMT1	0.485664941	0.0102	Olaparib 100mg/kg
DNMT1	0.421166615	0.0164	Olaparib 50mg/kg
DNMT3A	-0.08324264	0.6798	Olaparib 100mg/kg
DNMT3A	-0.173494865	0.3423	Olaparib 50mg/kg
DPYD	0.088733386	0.6598	Olaparib 100mg/kg
DPYD	0.047149894	0.7978	Olaparib 50mg/kg
DRD5	0.01011035	0.9601	Olaparib 100mg/kg
DRD5	0.085668999	0.6411	Olaparib 50mg/kg
DROSHA	0.320063817	0.1036	Olaparib 100mg/kg
DROSHA	0.206536618	0.2567	Olaparib 50mg/kg
DUSP6	0.098916167	0.6235	Olaparib 100mg/kg
DUSP6	0.029489768	0.8727	Olaparib 50mg/kg
DUX4	-0.107234879	0.5945	Olaparib 100mg/kg
DUX4	-0.074858388	0.6839	Olaparib 50mg/kg
ECSCR	0.144923537	0.4708	Olaparib 100mg/kg
ECSCR	0.16391635	0.3700	Olaparib 50mg/kg
EFNA2	-0.156590958	0.4354	Olaparib 100mg/kg
EFNA2	-0.009028008	0.9609	Olaparib 50mg/kg
EGF	-0.151340199	0.4511	Olaparib 100mg/kg

EGF	-0.097667272	0.5949	Olaparib 50mg/kg
EGFR	0.112388513	0.5768	Olaparib 100mg/kg
EGFR	0.091974661	0.6166	Olaparib 50mg/kg
EIF1AX	0.130385677	0.5168	Olaparib 100mg/kg
EIF1AX	0.007325892	0.9683	Olaparib 50mg/kg
EIF4EBP1	0.18888684	0.3454	Olaparib 100mg/kg
EIF4EBP1	0.153842525	0.4005	Olaparib 50mg/kg
EP300	0.328607471	0.0942	Olaparib 100mg/kg
EP300	0.297407742	0.0983	Olaparib 50mg/kg
EPAS1	0.00511244	0.9798	Olaparib 100mg/kg
EPAS1	-0.025697818	0.8890	Olaparib 50mg/kg
EPCAM	0.183737221	0.3589	Olaparib 100mg/kg
EPCAM	0.108359924	0.5550	Olaparib 50mg/kg
EPHB2	0.030594227	0.8796	Olaparib 100mg/kg
EPHB2	0.010074397	0.9564	Olaparib 50mg/kg
EPHB4	0.198634958	0.3206	Olaparib 100mg/kg
EPHB4	0.301930534	0.0931	Olaparib 50mg/kg
EPOR	0.076163369	0.7057	Olaparib 100mg/kg
EPOR	0.046944518	0.7986	Olaparib 50mg/kg
ERBB2	0.089513102	0.6570	Olaparib 100mg/kg
ERBB2	0.085309156	0.6425	Olaparib 50mg/kg
ERBB3	0.122225193	0.5436	Olaparib 100mg/kg
ERBB3	0.076405016	0.6777	Olaparib 50mg/kg
ERBB4	-0.16065963	0.4234	Olaparib 100mg/kg
ERBB4	-0.145876786	0.4257	Olaparib 50mg/kg
ERCC1	-0.003181869	0.9874	Olaparib 100mg/kg
ERCC1	0.036869324	0.8412	Olaparib 50mg/kg
ERCC2	0.265989553	0.1799	Olaparib 100mg/kg
ERCC2	0.252403345	0.1634	Olaparib 50mg/kg
ERCC5	0.429052275	0.0255	Olaparib 100mg/kg
ERCC5	0.353448167	0.0472	Olaparib 50mg/kg
EREG	0.262054473	0.1867	Olaparib 100mg/kg
EREG	0.194079135	0.2872	Olaparib 50mg/kg
ERG	0.0390817	0.8465	Olaparib 100mg/kg

ERG	0.154869827	0.3974	Olaparib 50mg/kg
ERRFI1	0.281410991	0.1550	Olaparib 100mg/kg
ERRFI1	0.197051446	0.2797	Olaparib 50mg/kg
ESR1	0.006529643	0.9742	Olaparib 100mg/kg
ESR1	-0.015902088	0.9312	Olaparib 50mg/kg
ETS2	0.294420088	0.1360	Olaparib 100mg/kg
ETS2	0.221453261	0.2232	Olaparib 50mg/kg
ETV1	-0.058459415	0.7721	Olaparib 100mg/kg
ETV1	-0.171322901	0.3485	Olaparib 50mg/kg
ETV4	0.240320422	0.2273	Olaparib 100mg/kg
ETV4	-0.015783396	0.9317	Olaparib 50mg/kg
ETV5	0.195407031	0.3287	Olaparib 100mg/kg
ETV5	0.023676362	0.8977	Olaparib 50mg/kg
ETV6	0.376273651	0.0531	Olaparib 100mg/kg
ETV6	0.140712164	0.4424	Olaparib 50mg/kg
EWSR1	0.369766075	0.0576	Olaparib 100mg/kg
EWSR1	0.281964897	0.1179	Olaparib 50mg/kg
EZH2	0.040807131	0.8398	Olaparib 100mg/kg
EZH2	-0.060562976	0.7420	Olaparib 50mg/kg
FANCA	0.230540578	0.2473	Olaparib 100mg/kg
FANCA	0.195978582	0.2824	Olaparib 50mg/kg
FANCC	0.087321281	0.6649	Olaparib 100mg/kg
FANCC	0.161003721	0.3787	Olaparib 50mg/kg
FBXW7	0.303385325	0.1240	Olaparib 100mg/kg
FBXW7	0.209966689	0.2487	Olaparib 50mg/kg
FCGR2A	0.180896792	0.3665	Olaparib 100mg/kg
FCGR2A	0.211943106	0.2442	Olaparib 50mg/kg
FCGR2B	0.28123985	0.1553	Olaparib 100mg/kg
FCGR2B	0.229299014	0.2068	Olaparib 50mg/kg
FCGR3A	-0.049184465	0.8075	Olaparib 100mg/kg
FCGR3A	-0.076308404	0.6781	Olaparib 50mg/kg
FGF13	-0.095866606	0.6343	Olaparib 100mg/kg
FGF13	-0.079786284	0.6642	Olaparib 50mg/kg
FGF19	0.288412721	0.1446	Olaparib 100mg/kg

FGF19	0.216572201	0.2338	Olaparib 50mg/kg
FGF2	0.248272036	0.2118	Olaparib 100mg/kg
FGF2	0.152825531	0.4037	Olaparib 50mg/kg
FGF3	0.181273348	0.3655	Olaparib 100mg/kg
FGF3	0.131759098	0.4722	Olaparib 50mg/kg
FGFR1	0.036082192	0.8582	Olaparib 100mg/kg
FGFR1	0.092292476	0.6154	Olaparib 50mg/kg
FGFR2	-0.102617256	0.6105	Olaparib 100mg/kg
FGFR2	-0.132210533	0.4707	Olaparib 50mg/kg
FGFR3	-0.171277367	0.3930	Olaparib 100mg/kg
FGFR3	-0.07816033	0.6707	Olaparib 50mg/kg
FGFR4	0.142836731	0.4772	Olaparib 100mg/kg
FGFR4	0.172628437	0.3448	Olaparib 50mg/kg
FLCN	0.217078907	0.2768	Olaparib 100mg/kg
FLCN	0.251963766	0.1642	Olaparib 50mg/kg
FLI1	-0.155299321	0.4392	Olaparib 100mg/kg
FLI1	-0.002521884	0.9891	Olaparib 50mg/kg
FLT3	-0.073153227	0.7169	Olaparib 100mg/kg
FLT3	-0.070424443	0.7017	Olaparib 50mg/kg
FLT4	0.268281505	0.1760	Olaparib 100mg/kg
FLT4	0.234458488	0.1965	Olaparib 50mg/kg
FNTB	0.275024312	0.1650	Olaparib 100mg/kg
FNTB	0.226122086	0.2133	Olaparib 50mg/kg
FOS	0.033270377	0.8691	Olaparib 100mg/kg
FOS	0.083947768	0.6478	Olaparib 50mg/kg
FOXC2	0.165713709	0.4088	Olaparib 100mg/kg
FOXC2	0.295633078	0.1004	Olaparib 50mg/kg
FOXL2	0.060554072	0.7642	Olaparib 100mg/kg
FOXL2	0.180410797	0.3231	Olaparib 50mg/kg
FOXO1	0.041837341	0.8359	Olaparib 100mg/kg
FOXO1	0.009643617	0.9582	Olaparib 50mg/kg
FOXO3	0.171910847	0.3912	Olaparib 100mg/kg
FOXO3	0.290181054	0.1072	Olaparib 50mg/kg
FOXP1	0.198273967	0.3215	Olaparib 100mg/kg

FOXP1	0.082712359	0.6527	Olaparib 50mg/kg
FOXP3	4.5665E-05	0.9998	Olaparib 100mg/kg
FOXP3	0.221288144	0.2235	Olaparib 50mg/kg
FUBP1	0.528181075	0.0046	Olaparib 100mg/kg
FUBP1	0.405279431	0.0214	Olaparib 50mg/kg
GADD45A	0.100790831	0.6169	Olaparib 100mg/kg
GADD45A	0.060776328	0.7411	Olaparib 50mg/kg
GAS6	-0.077391293	0.7012	Olaparib 100mg/kg
GAS6	-0.045051163	0.8066	Olaparib 50mg/kg
GATA1	-0.142824216	0.4773	Olaparib 100mg/kg
GATA1	0.008952375	0.9612	Olaparib 50mg/kg
GATA2	-0.061251451	0.7615	Olaparib 100mg/kg
GATA2	0.099317795	0.5886	Olaparib 50mg/kg
GLI1	0.072979775	0.7175	Olaparib 100mg/kg
GLI1	0.100463138	0.5843	Olaparib 50mg/kg
GNA11	0.056009252	0.7814	Olaparib 100mg/kg
GNA11	0.111045129	0.5451	Olaparib 50mg/kg
GNAQ	0.239681854	0.2285	Olaparib 100mg/kg
GNAQ	0.078186355	0.6706	Olaparib 50mg/kg
GNAS	0.285696039	0.1486	Olaparib 100mg/kg
GNAS	0.313518056	0.0806	Olaparib 50mg/kg
GSTP1	0.29839351	0.1306	Olaparib 100mg/kg
GSTP1	0.073079229	0.6910	Olaparib 50mg/kg
HAVCR2	-0.016632262	0.9344	Olaparib 100mg/kg
HAVCR2	0.032952231	0.8579	Olaparib 50mg/kg
HDAC2	0.189220701	0.3445	Olaparib 100mg/kg
HDAC2	0.215520825	0.2362	Olaparib 50mg/kg
HGF	-0.279610616	0.1578	Olaparib 100mg/kg
HGF	-0.02726602	0.8822	Olaparib 50mg/kg
HIF1A	0.142643019	0.4779	Olaparib 100mg/kg
HIF1A	0.121018194	0.5094	Olaparib 50mg/kg
HMGA2	0.088292997	0.6614	Olaparib 100mg/kg
HMGA2	0.177741075	0.3304	Olaparib 50mg/kg
HMOX1	-0.019264679	0.9240	Olaparib 100mg/kg



HMOX1	-0.096153625	0.6006	Olaparib 50mg/kg
HOXB13	0.101839432	0.6132	Olaparib 100mg/kg
HOXB13	0.10868316	0.5538	Olaparib 50mg/kg
HOXD8	-0.214333847	0.2830	Olaparib 100mg/kg
HOXD8	-0.079741815	0.6644	Olaparib 50mg/kg
HRAS	0.022210221	0.9124	Olaparib 100mg/kg
HRAS	0.058339371	0.7511	Olaparib 50mg/kg
HSPA5	0.057839769	0.7744	Olaparib 100mg/kg
HSPA5	-0.091438887	0.6187	Olaparib 50mg/kg
HSPB1	0.038776846	0.8477	Olaparib 100mg/kg
HSPB1	0.083575879	0.6493	Olaparib 50mg/kg
HSPH1	0.293033836	0.1380	Olaparib 100mg/kg
HSPH1	0.178542205	0.3282	Olaparib 50mg/kg
IDH1	0.201714495	0.3130	Olaparib 100mg/kg
IDH1	0.117016909	0.5236	Olaparib 50mg/kg
IDH2	0.174684932	0.3835	Olaparib 100mg/kg
IDH2	0.026345169	0.8862	Olaparib 50mg/kg
IGF1R	0.128936535	0.5216	Olaparib 100mg/kg
IGF1R	0.141218907	0.4407	Olaparib 50mg/kg
IGF2	-0.019442995	0.9233	Olaparib 100mg/kg
IGF2	0.117336752	0.5225	Olaparib 50mg/kg
IKZF1	-0.156789168	0.4348	Olaparib 100mg/kg
IKZF1	0.11464315	0.5321	Olaparib 50mg/kg
IL2RB	-0.005170284	0.9796	Olaparib 100mg/kg
IL2RB	0.022562469	0.9024	Olaparib 50mg/kg
IL33	0.330918278	0.0918	Olaparib 100mg/kg
IL33	0.268456411	0.1374	Olaparib 50mg/kg
IL6	0.215254884	0.2809	Olaparib 100mg/kg
IL6	0.141492394	0.4398	Olaparib 50mg/kg
IL7R	0.053828655	0.7897	Olaparib 100mg/kg
IL7R	-0.007001231	0.9697	Olaparib 50mg/kg
IRS2	0.337471816	0.0852	Olaparib 100mg/kg
IRS2	0.281295856	0.1188	Olaparib 50mg/kg
JAK1	0.257359473	0.1950	Olaparib 100mg/kg

JAK1	0.127634098	0.4863	Olaparib 50mg/kg
JAK2	0.102623014	0.6105	Olaparib 100mg/kg
JAK2	0.025941522	0.8879	Olaparib 50mg/kg
JAK3	0.276512241	0.1627	Olaparib 100mg/kg
JAK3	0.307056239	0.0874	Olaparib 50mg/kg
JUN	0.08538532	0.6720	Olaparib 100mg/kg
JUN	-0.01495402	0.9353	Olaparib 50mg/kg
KDM5C	0.006208938	0.9755	Olaparib 100mg/kg
KDM5C	-0.001274756	0.9945	Olaparib 50mg/kg
KDM6A	0.278840432	0.1590	Olaparib 100mg/kg
KDM6A	0.315908374	0.0782	Olaparib 50mg/kg
KDR	-0.0852974	0.6723	Olaparib 100mg/kg
KDR	0.067621998	0.7131	Olaparib 50mg/kg
KIF23	0.519880067	0.0054	Olaparib 100mg/kg
KIF23	0.368637592	0.0379	Olaparib 50mg/kg
KIT	0.148915188	0.4585	Olaparib 100mg/kg
KIT	0.00189762	0.9918	Olaparib 50mg/kg
KLLN	0.158318035	0.4303	Olaparib 100mg/kg
KLLN	-0.046206904	0.8017	Olaparib 50mg/kg
KMT2A	0.279170508	0.1585	Olaparib 100mg/kg
KMT2A	0.233683817	0.1980	Olaparib 50mg/kg
KMT2C	0.188807567	0.3456	Olaparib 100mg/kg
KMT2C	0.138661074	0.4491	Olaparib 50mg/kg
KMT2D	0.172715764	0.3890	Olaparib 100mg/kg
KMT2D	0.072170362	0.6947	Olaparib 50mg/kg
KRAS	0.377052208	0.0525	Olaparib 100mg/kg
KRAS	0.222929554	0.2200	Olaparib 50mg/kg
KRT18	0.093006127	0.6445	Olaparib 100mg/kg
KRT18	0.089851122	0.6248	Olaparib 50mg/kg
LAG3	0.239035191	0.2298	Olaparib 100mg/kg
LAG3	0.173757728	0.3416	Olaparib 50mg/kg
LEPR	0.413697771	0.0319	Olaparib 100mg/kg
LEPR	0.564201021	0.0008	Olaparib 50mg/kg
LRP1B	0.256882046	0.1958	Olaparib 100mg/kg

LRP1B	0.076006461	0.6793	Olaparib 50mg/kg
LYN	0.123235902	0.5403	Olaparib 100mg/kg
LYN	-0.039796105	0.8288	Olaparib 50mg/kg
LZTR1	0.002571339	0.9898	Olaparib 100mg/kg
LZTR1	-0.074936335	0.6836	Olaparib 50mg/kg
NBN	0.454911476	0.0171	Olaparib 100mg/kg
NBN	0.367143813	0.0387	Olaparib 50mg/kg
NCOA2	0.405264385	0.0360	Olaparib 100mg/kg
NCOA2	0.345932457	0.0525	Olaparib 50mg/kg
NCOA3	0.214076511	0.2836	Olaparib 100mg/kg
NCOA3	0.360073475	0.0429	Olaparib 50mg/kg
NEDD9	0.104747198	0.6031	Olaparib 100mg/kg
NEDD9	0.117803866	0.5208	Olaparib 50mg/kg
NF1	0.333487919	0.0891	Olaparib 100mg/kg
NF1	0.305852839	0.0887	Olaparib 50mg/kg
NF2	-0.034499811	0.8644	Olaparib 100mg/kg
NF2	-0.034548427	0.8511	Olaparib 50mg/kg
NFE2L2	0.484642146	0.0104	Olaparib 100mg/kg
NFE2L2	0.255714244	0.1578	Olaparib 50mg/kg
NOTCH1	0.056254337	0.7805	Olaparib 100mg/kg
NOTCH1	0.031165755	0.8655	Olaparib 50mg/kg
NOTCH3	0.156761314	0.4349	Olaparib 100mg/kg
NOTCH3	0.083003738	0.6515	Olaparib 50mg/kg
NPM1	0.280029182	0.1572	Olaparib 100mg/kg
NPM1	0.260207103	0.1503	Olaparib 50mg/kg
NQO1	0.161543605	0.4208	Olaparib 100mg/kg
NQO1	-0.020932159	0.9095	Olaparib 50mg/kg
NR2F2	-0.030907192	0.8784	Olaparib 100mg/kg
NR2F2	-0.270463016	0.1344	Olaparib 50mg/kg
NRAS	0.191847818	0.3377	Olaparib 100mg/kg
NRAS	-0.04921129	0.7891	Olaparib 50mg/kg
NRG1	-0.066814537	0.7406	Olaparib 100mg/kg
NRG1	-0.294208741	0.1022	Olaparib 50mg/kg
NT5C2	0.313652664	0.1111	Olaparib 100mg/kg

NT5C2	0.237694226	0.1902	Olaparib 50mg/kg
NT5E	-0.105741304	0.5996	Olaparib 100mg/kg
NT5E	-0.019848482	0.9141	Olaparib 50mg/kg
NTRK1	-0.080682607	0.6891	Olaparib 100mg/kg
NTRK1	-0.003823663	0.9834	Olaparib 50mg/kg
NTRK2	0.193477563	0.3336	Olaparib 100mg/kg
NTRK2	0.112990568	0.5381	Olaparib 50mg/kg
NTRK3	0.201235954	0.3142	Olaparib 100mg/kg
NTRK3	0.147787413	0.4196	Olaparib 50mg/kg
NUDT15	0.478406026	0.0116	Olaparib 100mg/kg
NUDT15	0.200331498	0.2716	Olaparib 50mg/kg
NUP98	0.501720951	0.0077	Olaparib 100mg/kg
NUP98	0.361552497	0.0420	Olaparib 50mg/kg
PALB2	0.39546431	0.0412	Olaparib 100mg/kg
PALB2	0.261279557	0.1486	Olaparib 50mg/kg
PAPPA2	0.156408363	0.4359	Olaparib 100mg/kg
PAPPA2	0.118811959	0.5172	Olaparib 50mg/kg
PARP1	0.348434157	0.0749	Olaparib 100mg/kg
PARP1	0.054400748	0.7674	Olaparib 50mg/kg
PAX5	0.196439519	0.3261	Olaparib 100mg/kg
PAX5	0.227676121	0.2101	Olaparib 50mg/kg
PAX8	0.153306247	0.4452	Olaparib 100mg/kg
PAX8	0.176460224	0.3340	Olaparib 50mg/kg
PBK	0.463575625	0.0149	Olaparib 100mg/kg
PBK	0.370247491	0.0370	Olaparib 50mg/kg
PBLD	0.23318209	0.2418	Olaparib 100mg/kg
PBLD	0.217611407	0.2315	Olaparib 50mg/kg
PBRM1	0.375920232	0.0533	Olaparib 100mg/kg
PBRM1	0.28391025	0.1153	Olaparib 50mg/kg
PCNA	0.064563194	0.7490	Olaparib 100mg/kg
PCNA	0.052713335	0.7745	Olaparib 50mg/kg
PDCD1LG2	0.058247036	0.7729	Olaparib 100mg/kg
PDCD1LG2	-0.06641767	0.7180	Olaparib 50mg/kg
PDCD4	0.175566472	0.3811	Olaparib 100mg/kg

PDCD4	0.172975253	0.3438	Olaparib 50mg/kg
PDGFB	-0.08563625	0.6711	Olaparib 100mg/kg
PDGFB	-0.033790312	0.8543	Olaparib 50mg/kg
PDGFRA	-0.003114249	0.9877	Olaparib 100mg/kg
PDGFRA	0.043976352	0.8111	Olaparib 50mg/kg
PDGFRB	0.055949331	0.7816	Olaparib 100mg/kg
PDGFRB	0.048300969	0.7929	Olaparib 50mg/kg
PGR	-0.014469659	0.9429	Olaparib 100mg/kg
PGR	-0.134347021	0.4635	Olaparib 50mg/kg
PIK3CA	0.239724912	0.2284	Olaparib 100mg/kg
PIK3CA	0.145776851	0.4260	Olaparib 50mg/kg
PIK3R1	0.276387608	0.1628	Olaparib 100mg/kg
PIK3R1	0.216869486	0.2332	Olaparib 50mg/kg
PIM1	0.079344426	0.6940	Olaparib 100mg/kg
PIM1	0.093217482	0.6118	Olaparib 50mg/kg
PLCG2	0.17052469	0.3951	Olaparib 100mg/kg
PLCG2	0.140485915	0.4431	Olaparib 50mg/kg
PLK1	0.31589131	0.1085	Olaparib 100mg/kg
PLK1	0.211491967	0.2452	Olaparib 50mg/kg
PML	-0.006447297	0.9745	Olaparib 100mg/kg
PML	-0.104965166	0.5675	Olaparib 50mg/kg
PMS2	0.331932585	0.0907	Olaparib 100mg/kg
PMS2	0.239215338	0.1873	Olaparib 50mg/kg
POLD1	0.221113686	0.2677	Olaparib 100mg/kg
POLD1	0.211316234	0.2456	Olaparib 50mg/kg
POLE	0.429783342	0.0253	Olaparib 100mg/kg
POLE	0.256283873	0.1568	Olaparib 50mg/kg
POLE4	0.160096502	0.4251	Olaparib 100mg/kg
POLE4	0.167893842	0.3584	Olaparib 50mg/kg
POT1	0.415741244	0.0310	Olaparib 100mg/kg
POT1	0.315545118	0.0785	Olaparib 50mg/kg
POU5F1	0.376625838	0.0528	Olaparib 100mg/kg
POU5F1	0.327648842	0.0672	Olaparib 50mg/kg
PPP1R15A	0.124007529	0.5377	Olaparib 100mg/kg

PPP1R15A	0.078265429	0.6703	Olaparib 50mg/kg
PRDM1	0.223991248	0.2614	Olaparib 100mg/kg
PRDM1	0.184861374	0.3111	Olaparib 50mg/kg
PREX2	0.306481596	0.1200	Olaparib 100mg/kg
PREX2	0.035090715	0.8488	Olaparib 50mg/kg
PRKAA2	-0.213402953	0.2852	Olaparib 100mg/kg
PRKAA2	-0.222614278	0.2207	Olaparib 50mg/kg
PRKACA	0.284608052	0.1502	Olaparib 100mg/kg
PRKACA	0.20983567	0.2490	Olaparib 50mg/kg
PRKAR1A	0.167056634	0.4049	Olaparib 100mg/kg
PRKAR1A	-0.043480161	0.8132	Olaparib 50mg/kg
PRKCB	0.219768627	0.2707	Olaparib 100mg/kg
PRKCB	0.217163945	0.2325	Olaparib 50mg/kg
PROM1	0.087563372	0.6641	Olaparib 100mg/kg
PROM1	-0.091939812	0.6168	Olaparib 50mg/kg
PRPS1	0.078667991	0.6965	Olaparib 100mg/kg
PRPS1	0.097935483	0.5939	Olaparib 50mg/kg
PSMB8	-0.115052271	0.5677	Olaparib 100mg/kg
PSMB8	-0.181463216	0.3202	Olaparib 50mg/kg
PSMD4	0.243677408	0.2206	Olaparib 100mg/kg
PSMD4	0.11302042	0.5380	Olaparib 50mg/kg
PTCH1	0.016684396	0.9342	Olaparib 100mg/kg
PTCH1	-0.014571081	0.9369	Olaparib 50mg/kg
PTEN	-0.163806928	0.4143	Olaparib 100mg/kg
PTEN	-0.265356847	0.1422	Olaparib 50mg/kg
PTGS2	-0.145195668	0.4699	Olaparib 100mg/kg
PTGS2	-0.082227697	0.6546	Olaparib 50mg/kg
PTK2B	-0.074003826	0.7137	Olaparib 100mg/kg
PTK2B	0.019978428	0.9136	Olaparib 50mg/kg
PTP4A3	-0.214501236	0.2826	Olaparib 100mg/kg
PTP4A3	-0.118135567	0.5196	Olaparib 50mg/kg
PTPN11	0.563940488	0.0022	Olaparib 100mg/kg
PTPN11	0.365388882	0.0397	Olaparib 50mg/kg
PTPN12	0.264456492	0.1825	Olaparib 100mg/kg

PTPN12	0.285563393	0.1131	Olaparib 50mg/kg
PTPN6	0.329846655	0.0929	Olaparib 100mg/kg
PTPN6	0.155409492	0.3957	Olaparib 50mg/kg
PTPRB	-0.017920331	0.9293	Olaparib 100mg/kg
PTPRB	-0.040953764	0.8239	Olaparib 50mg/kg
PTPRD	-0.223646121	0.2621	Olaparib 100mg/kg
PTPRD	-0.185618828	0.3091	Olaparib 50mg/kg
PTPRF	0.196816003	0.3251	Olaparib 100mg/kg
PTPRF	0.114650326	0.5321	Olaparib 50mg/kg
PTPRT	-0.258249639	0.1934	Olaparib 100mg/kg
PTPRT	-0.175349579	0.3371	Olaparib 50mg/kg
PTTG1	0.274190935	0.1664	Olaparib 100mg/kg
PTTG1	0.192505084	0.2912	Olaparib 50mg/kg
PXDNL	-0.137882768	0.4928	Olaparib 100mg/kg
PXDNL	-0.305822448	0.0887	Olaparib 50mg/kg
RABL3	0.447221618	0.0193	Olaparib 100mg/kg
RABL3	0.365067726	0.0399	Olaparib 50mg/kg
RAC1	0.099033366	0.6231	Olaparib 100mg/kg
RAC1	0.051715274	0.7786	Olaparib 50mg/kg
RAD23B	0.193919809	0.3324	Olaparib 100mg/kg
RAD23B	0.148398386	0.4176	Olaparib 50mg/kg
RAD50	0.415478877	0.0311	Olaparib 100mg/kg
RAD50	0.431815761	0.0136	Olaparib 50mg/kg
RAD51D	0.13873865	0.4901	Olaparib 100mg/kg
RAD51D	0.214472466	0.2385	Olaparib 50mg/kg
RAF1	0.234050819	0.2400	Olaparib 100mg/kg
RAF1	0.018876977	0.9183	Olaparib 50mg/kg
RASA1	0.323950152	0.0993	Olaparib 100mg/kg
RASA1	0.268213065	0.1377	Olaparib 50mg/kg
RB1	0.37595315	0.0533	Olaparib 100mg/kg
RB1	0.172295412	0.3457	Olaparib 50mg/kg
RBM15	0.342833392	0.0800	Olaparib 100mg/kg
RBM15	0.393707566	0.0258	Olaparib 50mg/kg
RCSD1	0.194910896	0.3299	Olaparib 100mg/kg

RCSD1	0.089816038	0.6249	Olaparib 50mg/kg
REL	0.345051545	0.0780	Olaparib 100mg/kg
REL	0.448054731	0.0101	Olaparib 50mg/kg
RELA	0.165696619	0.4088	Olaparib 100mg/kg
RELA	-0.034158991	0.8528	Olaparib 50mg/kg
RET	0.217077393	0.2768	Olaparib 100mg/kg
RET	0.222749541	0.2204	Olaparib 50mg/kg
RHEB	0.212477533	0.2873	Olaparib 100mg/kg
RHEB	0.060993719	0.7402	Olaparib 50mg/kg
RHOA	0.355260576	0.0690	Olaparib 100mg/kg
RHOA	0.304706704	0.0899	Olaparib 50mg/kg
RICTOR	0.207545816	0.2989	Olaparib 100mg/kg
RICTOR	0.134715584	0.4623	Olaparib 50mg/kg
RIT1	0.124817785	0.5350	Olaparib 100mg/kg
RIT1	0.046995343	0.7984	Olaparib 50mg/kg
ROBO4	-0.159715151	0.4262	Olaparib 100mg/kg
ROBO4	-0.201604735	0.2685	Olaparib 50mg/kg
ROS1	0.029182858	0.8851	Olaparib 100mg/kg
ROS1	-0.027519594	0.8812	Olaparib 50mg/kg
RPS6	-0.084613248	0.6748	Olaparib 100mg/kg
RPS6	-0.113317517	0.5369	Olaparib 50mg/kg
RRM1	0.340968781	0.0818	Olaparib 100mg/kg
RRM1	0.224378862	0.2170	Olaparib 50mg/kg
RRM2	-0.024205166	0.9046	Olaparib 100mg/kg
RRM2	0.052083751	0.7771	Olaparib 50mg/kg
RSF1	0.238548858	0.2308	Olaparib 100mg/kg
RSF1	0.170623459	0.3505	Olaparib 50mg/kg
RUNX1	0.216695625	0.2776	Olaparib 100mg/kg
RUNX1	0.241683484	0.1827	Olaparib 50mg/kg
SCN8A	-0.236671667	0.2346	Olaparib 100mg/kg
SCN8A	-0.131286857	0.4738	Olaparib 50mg/kg
SDHA	0.404356029	0.0364	Olaparib 100mg/kg
SDHA	0.228501693	0.2084	Olaparib 50mg/kg
SDHB	0.188779237	0.3457	Olaparib 100mg/kg



SDHB	0.026182575	0.8869	Olaparib 50mg/kg
SETBP1	-0.049407768	0.8067	Olaparib 100mg/kg
SETBP1	-0.119572976	0.5145	Olaparib 50mg/kg
SF3B1	0.31387192	0.1109	Olaparib 100mg/kg
SF3B1	0.120283042	0.5120	Olaparib 50mg/kg
SGK1	0.309240986	0.1165	Olaparib 100mg/kg
SGK1	0.269908239	0.1352	Olaparib 50mg/kg
SH2B3	0.281897618	0.1543	Olaparib 100mg/kg
SH2B3	0.217199633	0.2324	Olaparib 50mg/kg
SIRT1	0.370664487	0.0570	Olaparib 100mg/kg
SIRT1	0.310137528	0.0841	Olaparib 50mg/kg
SLCO1B1	0.145244916	0.4698	Olaparib 100mg/kg
SLCO1B1	0.063910099	0.7282	Olaparib 50mg/kg
SLFN11	-0.077034156	0.7025	Olaparib 100mg/kg
SLFN11	0.082908707	0.6519	Olaparib 50mg/kg
SMAD4	0.379498416	0.0509	Olaparib 100mg/kg
SMAD4	0.302664504	0.0922	Olaparib 50mg/kg
SMARCA4	0.26996792	0.1732	Olaparib 100mg/kg
SMARCA4	0.19701375	0.2798	Olaparib 50mg/kg
SMARCB1	0.169176434	0.3989	Olaparib 100mg/kg
SMARCB1	0.139775028	0.4455	Olaparib 50mg/kg
SMO	0.238941131	0.2300	Olaparib 100mg/kg
SMO	-0.040959265	0.8239	Olaparib 50mg/kg
SOX10	0.030039355	0.8818	Olaparib 100mg/kg
SOX10	-0.093581896	0.6104	Olaparib 50mg/kg
SPHK1	0.108528865	0.5900	Olaparib 100mg/kg
SPHK1	-0.119003528	0.5165	Olaparib 50mg/kg
SPRY2	0.31423876	0.1104	Olaparib 100mg/kg
SPRY2	0.210895744	0.2466	Olaparib 50mg/kg
SRSF2	0.521425894	0.0053	Olaparib 100mg/kg
SRSF2	0.296475035	0.0994	Olaparib 50mg/kg
SSX1	-0.298305456	0.1307	Olaparib 100mg/kg
SSX1	-0.013627963	0.9410	Olaparib 50mg/kg
SSX2	0.172573104	0.3894	Olaparib 100mg/kg

SSX2	0.11090587	0.5457	Olaparib 50mg/kg
SSX4	-0.206389578	0.3017	Olaparib 100mg/kg
SSX4	-0.251033011	0.1658	Olaparib 50mg/kg
STAG2	0.386847606	0.0462	Olaparib 100mg/kg
STAG2	0.31357889	0.0805	Olaparib 50mg/kg
STAG3	0.361541062	0.0639	Olaparib 100mg/kg
STAG3	0.363952271	0.0406	Olaparib 50mg/kg
STAT1	-0.171400644	0.3926	Olaparib 100mg/kg
STAT1	-0.265302497	0.1422	Olaparib 50mg/kg
STAT3	0.268321984	0.1760	Olaparib 100mg/kg
STAT3	0.083754864	0.6486	Olaparib 50mg/kg
STAT5B	0.113697979	0.5723	Olaparib 100mg/kg
STAT5B	0.050046762	0.7856	Olaparib 50mg/kg
STAT6	-0.088570286	0.6604	Olaparib 100mg/kg
STAT6	-0.180558656	0.3227	Olaparib 50mg/kg
STK11	-0.023304599	0.9081	Olaparib 100mg/kg
STK11	0.050673625	0.7830	Olaparib 50mg/kg
STMN1	0.103651469	0.6069	Olaparib 100mg/kg
STMN1	0.147641079	0.4200	Olaparib 50mg/kg
SUFU	0.224041328	0.2613	Olaparib 100mg/kg
SUFU	0.092064898	0.6163	Olaparib 50mg/kg
SULT1E1	0.111530637	0.5797	Olaparib 100mg/kg
SULT1E1	0.207941688	0.2534	Olaparib 50mg/kg
SYK	-0.011097207	0.9562	Olaparib 100mg/kg
SYK	0.073231825	0.6904	Olaparib 50mg/kg
TACSTD2	0.116174748	0.5639	Olaparib 100mg/kg
TACSTD2	0.045813673	0.8034	Olaparib 50mg/kg
TBK1	0.319380338	0.1044	Olaparib 100mg/kg
TBK1	0.147052526	0.4219	Olaparib 50mg/kg
TEK	-0.001486847	0.9941	Olaparib 100mg/kg
TEK	0.068624342	0.7090	Olaparib 50mg/kg
TERT	0.435590399	0.0231	Olaparib 100mg/kg
TERT	0.265558248	0.1418	Olaparib 50mg/kg
TET2	0.191443309	0.3388	Olaparib 100mg/kg

TET2	0.241548662	0.1829	Olaparib 50mg/kg
TFF3	-0.201348161	0.3139	Olaparib 100mg/kg
TFF3	-0.227322742	0.2109	Olaparib 50mg/kg
TGFA	0.12813173	0.5242	Olaparib 100mg/kg
TGFA	0.059265228	0.7473	Olaparib 50mg/kg
TGFBR3	-0.036990896	0.8547	Olaparib 100mg/kg
TGFBR3	-0.150754965	0.4102	Olaparib 50mg/kg
THBS2	-0.149642312	0.4563	Olaparib 100mg/kg
THBS2	-0.212485693	0.2430	Olaparib 50mg/kg
TIMP1	0.20670028	0.3009	Olaparib 100mg/kg
TIMP1	0.161409444	0.3775	Olaparib 50mg/kg
TLK2	0.176359438	0.3789	Olaparib 100mg/kg
TLK2	0.051757554	0.7785	Olaparib 50mg/kg
TLX3	0.079962155	0.6918	Olaparib 100mg/kg
TLX3	0.147653549	0.4200	Olaparib 50mg/kg
TMPRSS2	0.171225148	0.3931	Olaparib 100mg/kg
TMPRSS2	0.01162659	0.9496	Olaparib 50mg/kg
TOP1	0.388085917	0.0455	Olaparib 100mg/kg
TOP1	0.42583444	0.0151	Olaparib 50mg/kg
TOP2A	0.356576677	0.0679	Olaparib 100mg/kg
TOP2A	0.331426641	0.0639	Olaparib 50mg/kg
TP53	0.306753402	0.1196	Olaparib 100mg/kg
TP53	0.053646243	0.7706	Olaparib 50mg/kg
TP53BP1	0.330725514	0.0920	Olaparib 100mg/kg
TP53BP1	0.024862169	0.8926	Olaparib 50mg/kg
TPT1	0.216985122	0.2770	Olaparib 100mg/kg
TPT1	0.177179934	0.3320	Olaparib 50mg/kg
TSC1	0.32607878	0.0969	Olaparib 100mg/kg
TSC1	0.147371653	0.4209	Olaparib 50mg/kg
TSC2	0.00849241	0.9665	Olaparib 100mg/kg
TSC2	-0.024087813	0.8959	Olaparib 50mg/kg
TSPYL1	0.127934156	0.5248	Olaparib 100mg/kg
TSPYL1	0.055308428	0.7637	Olaparib 50mg/kg
TTF1	0.238343984	0.2312	Olaparib 100mg/kg

TTF1	0.098384483	0.5922	Olaparib 50mg/kg
TYMS	0.21764867	0.2755	Olaparib 100mg/kg
TYMS	0.159787675	0.3824	Olaparib 50mg/kg
U2AF1	0.054140236	0.7885	Olaparib 100mg/kg
U2AF1	-0.056708514	0.7579	Olaparib 50mg/kg
VEGFA	-0.046099235	0.8194	Olaparib 100mg/kg
VEGFA	0.027846548	0.8798	Olaparib 50mg/kg
VEGFC	0.22010795	0.2699	Olaparib 100mg/kg
VEGFC	0.102603283	0.5763	Olaparib 50mg/kg
VHL	0.198474571	0.3210	Olaparib 100mg/kg
VHL	-0.003997194	0.9827	Olaparib 50mg/kg
VPS37A	0.157665258	0.4322	Olaparib 100mg/kg
VPS37A	0.310337006	0.0839	Olaparib 50mg/kg
WDR12	0.366697335	0.0599	Olaparib 100mg/kg
WDR12	0.097796177	0.5944	Olaparib 50mg/kg
WEE1	0.589730119	0.0012	Olaparib 100mg/kg
WEE1	0.479899559	0.0054	Olaparib 50mg/kg
WNT11	-0.161467351	0.4210	Olaparib 100mg/kg
WNT11	-0.1444012	0.4304	Olaparib 50mg/kg
WT1	-0.080527476	0.6897	Olaparib 100mg/kg
WT1	0.130420306	0.4768	Olaparib 50mg/kg
WWTR1	0.183843117	0.3587	Olaparib 100mg/kg
WWTR1	0.007001557	0.9697	Olaparib 50mg/kg
XRCC1	0.222966368	0.2636	Olaparib 100mg/kg
XRCC1	0.145415594	0.4271	Olaparib 50mg/kg
YAP1	0.160490939	0.4239	Olaparib 100mg/kg
YAP1	0.117412055	0.5222	Olaparib 50mg/kg
ZEB1	0.001324221	0.9948	Olaparib 100mg/kg
ZEB1	0.040239325	0.8269	Olaparib 50mg/kg
ZRSR2	0.186078205	0.3527	Olaparib 100mg/kg
ZRSR2A751	0.071381	0.6979	Olaparib 50mg/kg

**Supplementary Table 7.** Biomarker correlations. Pearson's linear correlation of resistance fraction and mRNA expression for all CIViC genes and both olaparib 100 and 50 mg/kg.

Gene	Group	p-value	Hazard ratio	Cox coefficients	Category
ABL2	Treated	2.35E-08	0.5334	-0.6284	Differentiates both groups
ARID2	Treated	0.660768	0.9529	-0.0482	No differential survival in either group
ASNS	Treated	1.02E-09	0.5022	-0.6888	Differentiates both groups
ATR	Treated	6.91E-08	0.5505	-0.5969	Differentiates both groups
AURKA	Treated	0.564024	1.0705	0.0681	Differntiates only untreated
BCL2	Treated	0.003405	0.7160	-0.3341	Differntiates only treated
BIRC5	Treated	7.32E-05	0.6318	-0.4592	Differntiates only treated
BRCA1	Treated	0.559291	1.0619	0.0601	No differential survival in either group
BRCA2	Treated	8.84E-12	0.4680	-0.7592	Differentiates both groups
CDK6	Treated	2.23E-06	0.5929	-0.5228	Differentiates both groups
CHEK1	Treated	0.009418	0.7481	-0.2903	Differntiates only treated
CHEK2	Treated	6.20E-06	0.5992	-0.5121	Differentiates both groups
DEK	Treated	0.003379	1.3835	0.3246	Differntiates only treated
DNMT1	Treated	0.147924	0.8502	-0.1623	No differential survival in either group
ERCC5	Treated	0.002606	0.7134	-0.3377	Differentiates both groups
FUBP1	Treated	0.144772	1.1748	0.1611	No differential survival in either group
KIF23	Treated	4.43E-11	0.4686	-0.7580	Differentiates both groups
LEPR	Treated	6.13E-08	0.5483	-0.6009	Differntiates only treated
NBN	Treated	3.92E-10	0.4957	-0.7017	Differentiates both groups
NCOA2	Treated	2.03E-06	0.5882	-0.5306	Differntiates only treated
NFE2L2	Treated	1.34E-09	0.5068	-0.6796	Differentiates both groups
NUDT15	Treated	5.38E-08	0.5444	-0.6080	Differntiates only treated
NUP98	Treated	1.37E-10	0.4925	-0.7083	Differentiates both groups
PALB2	Treated	0.020366	0.7755	-0.2542	Differentiates both groups
PBK	Treated	4.26E-06	0.6019	-0.5077	Differentiates both groups
POLE	Treated	0.000421	0.6721	-0.3974	Differntiates only treated
POT1	Treated	0.000173	0.6533	-0.4257	Differntiates only treated
PTPN11	Treated	1.77E-20	0.3501	-1.0496	Differentiates both groups
RABL3	Treated	1.23E-19	0.3340	-1.0966	Differentiates both groups
RAD50	Treated	0.315322	1.1201	0.1134	No differential survival in either group
SDHA	Treated	9.55E-06	0.6115	-0.4919	Differntiates only treated
SRSF2	Treated	3.47E-07	0.5592	-0.5813	Differntiates only treated
STAG2	Treated	0.002059	0.7045	-0.3503	Differentiates both groups

TERT	Treated	1.58E-18	0.3455	-1.0627	Differentiates both groups
TOP1	Treated	1.08E-09	0.5025	-0.6881	Differentiates both groups
WEE1	Treated	6.08E-13	0.4381	-0.8254	Differentiates both groups
ABL2	Untreated	1.91E-07	0.6362	-0.4522	Differentiates both groups
ARID2	Untreated	0.100905	1.1656	0.1532	No differential survival in either group
ASNS	Untreated	0.013953	0.8077	-0.2135	Differentiates both groups
ATR	Untreated	3.38E-05	0.7053	-0.3492	Differentiates both groups
AURKA	Untreated	2.30E-05	0.6652	-0.4076	Differntiates only untreated
BCL2	Untreated	0.681582	0.9706	-0.0299	Differntiates only treated
BIRC5	Untreated	0.787267	0.9715	-0.0289	Differntiates only treated
BRCA1	Untreated	0.682278	1.0348	0.0342	No differential survival in either group
BRCA2	Untreated	1.93E-14	0.4965	-0.7001	Differentiates both groups
CDK6	Untreated	7.98E-16	0.4829	-0.7280	Differentiates both groups
CHEK1	Untreated	0.052993	0.8473	-0.1657	Differntiates only treated
CHEK2	Untreated	4.48E-12	0.5123	-0.6688	Differentiates both groups
DEK	Untreated	0.071134	0.8553	-0.1563	Differntiates only treated
DNMT1	Untreated	0.107037	1.1674	0.1548	No differential survival in either group
ERCC5	Untreated	0.034476	0.8443	-0.1693	Differentiates both groups
FUBP1	Untreated	0.660861	1.0424	0.0415	No differential survival in either group
KIF23	Untreated	2.01E-08	0.6099	-0.4944	Differentiates both groups
LEPR	Untreated	0.301223	0.9155	-0.0883	Differntiates only treated
NBN	Untreated	0.015769	0.8194	-0.1991	Differentiates both groups
NCOA2	Untreated	0.517213	1.0621	0.0602	Differntiates only treated
NFE2L2	Untreated	6.03E-16	0.4737	-0.7472	Differentiates both groups
NUDT15	Untreated	0.177112	0.8817	-0.1259	Differntiates only treated
NUP98	Untreated	3.74E-08	0.6197	-0.4785	Differentiates both groups
PALB2	Untreated	4.62E-07	0.6516	-0.4283	Differentiates both groups
PBK	Untreated	5.23E-05	0.7010	-0.3553	Differentiates both groups
POLE	Untreated	0.145525	0.8867	-0.1202	Differntiates only treated
POT1	Untreated	0.13855	0.8747	-0.1339	Differntiates only treated
PTPN11	Untreated	1.80E-06	0.6664	-0.4059	Differentiates both groups
RABL3	Untreated	3.12E-06	0.6638	-0.4098	Differentiates both groups
RAD50	Untreated	0.409256	0.9172	-0.0865	No differential survival in either group
SDHA	Untreated	0.062964	1.1841	0.1690	Differntiates only treated

SRSF2	Untreated	0.511889	1.0723	0.0698	Differntiates only treated
STAG2	Untreated	0.005405	0.7656	-0.2671	Differentiates both groups
TERT	Untreated	1.63E-14	0.4939	-0.7054	Differentiates both groups
TOP1	Untreated	0.000118	0.7164	-0.3335	Differentiates both groups
WEE1	Untreated	3.97E-13	0.5104	-0.6725	Differentiates both groups

**Supplementary Table 8.** Survival analysis. Kaplan-Meier survival analysis for 100 mg/kg olaparib treatment and untreated groups only. P-value and hazard ratio is compared between treated and untreated groups to determine if a gene shows differential survival in both, either or neither group (category).

Gene	OncoKB Assessment					Literature Evidence		
	Therapeutic Level	Diagnostic Level	Prognostic Level	Resistance Level	FDA Level	Alterations	Pub. Title	Pub. Link
ABL2		Dx1	Px1			Likely oncogenic	of breast cancer <i>in vivo</i>	<a href="https://www.nature.com/articles/onc2012284">https://www.nature.com/articles/onc2012284</a>
ARID2						Likely oncogenic	Relapse	<a href="https://doi.org/10.3389/fonc.2022.880643">S1535610817302970?via%3Dihub</a>
ASNS							Cellular Response to Olaparib Treatment	<a href="https://www.mdpi.com/2072-6694/14/15/3661">https://www.mdpi.com/2072-6694/14/15/3661</a>
ATR						Likely oncogenic	resistance to olaparib and dysregulates DNA damage response protein expression in <i>BRCA2</i> MUTovarian cancer	<a href="https://www.nature.com/articles/s41598-023-50151-y">https://www.nature.com/articles/s41598-023-50151-y</a>
AURKA						Oncogenic	and poly(ADP-ribose) polymerase function in ovarian	<a href="https://www.oncotarget.com/article/18970/text/">https://www.oncotarget.com/article/18970/text/</a>
BCL2		Dx2				Oncogenic	combinations with PARP inhibitors in ovarian cancer	<a href="https://doi.org/10.3389/fonc.2022.880643">PII52352-3964(20)30364-9/fulltext</a>
BIRC5							drug resistance in cancer therapy	<a href="https://doi.org/10.3389/fonc.2022.880643">S0168365916302218</a>
BRCA1	1				2	Oncogenic	Colorectal, Pancreatic, Non-Small Cell Lung and Prostate Cancers, and the Mechanisms of Resistance to PARP	<a href="https://www.frontiersin.org/journals/oncology/articles/10.3389/fonc.2022.880643/full">https://www.frontiersin.org/journals/oncology/articles/10.3389/fonc.2022.880643/full</a>
BRCA2	1				2	Oncogenic	Colorectal, Pancreatic, Non-Small Cell Lung and Prostate Cancers, and the Mechanisms of Resistance to PARP	<a href="https://www.frontiersin.org/journals/oncology/articles/10.3389/fonc.2022.880643/full">https://www.frontiersin.org/journals/oncology/articles/10.3389/fonc.2022.880643/full</a>
CDK6						Oncogenic	combinations	<a href="https://doi.org/10.3389/fonc.2022.880643">02326-7</a>
CHEK1	1				2	Likely oncogenic	resistance to olaparib and dysregulates DNA damage response protein expression in <i>BRCA2</i> MUTovarian cancer	<a href="https://www.nature.com/articles/s41598-023-50151-y">https://www.nature.com/articles/s41598-023-50151-y</a>
CHEK2	1				2	Oncogenic	combinations	<a href="https://doi.org/10.3389/fonc.2022.880643">02326-7</a>
CTAG1B							immunomodulatory and nano-therapeutic approaches	<a href="https://doi.org/10.3389/fonc.2022.880643">S0168365922004631</a>
DEK		Dx1	Px1			Oncogenic	Alternative Activation of Tumor Associated Macrophages	<a href="https://www.mdpi.com/2072-6694/12/7/1936">https://www.mdpi.com/2072-6694/12/7/1936</a>
DNMT1							resistance in cancers	<a href="https://doi.org/10.3389/fonc.2022.880643">01341-7</a>
ERCC5							Biomarkers of Response and Resistance to DNA Repair Targeted Therapies	<a href="https://doi.org/10.3389/fonc.2022.880643">/5651/122919/Biomarkers-of-Response-and-Resistance-to-DNA</a>
FUBP1							Widespread Regulator of Tumor Suppressor and Oncogene Alternative Splicing	<a href="https://www.sciencedirect.com/science/article/pii/S2211124719311088?via%3Dihub">https://www.sciencedirect.com/science/article/pii/S2211124719311088?via%3Dihub</a>
KIF23							at stressed replication forks	<a href="https://doi.org/10.3389/fonc.2022.880643">/6814461</a>
LEPR							Microenvironment Promotes Development of Triple	<a href="https://www.mdpi.com/2072-6694/14/17/4139">https://www.mdpi.com/2072-6694/14/17/4139</a>
NBN						Likely oncogenic	overcoming strategies	<a href="https://doi.org/10.1016/j.gendis.2023.02.014">https://doi.org/10.1016/j.gendis.2023.02.014</a>
NCOA2							Cancer Cell Growth by Positively Regulating the	<a href="https://doi.org/10.3389/fonc.2019.00164/full">cles/10.3389/fonc.2019.00164/full</a>
NCOA3							Cancer Cell Growth by Positively Regulating the	<a href="https://doi.org/10.3389/fonc.2019.00164/full">cles/10.3389/fonc.2019.00164/full</a>
NFE2L2						Oncogenic	NFE2L2/NRF2 activation in breast cancer stem cell-like cells: Implications for cancer stem cell resistance	<a href="https://www.sciencedirect.com/science/article/pii/S2213231718301460">https://www.sciencedirect.com/science/article/pii/S2213231718301460</a>
NUDT15							Role of the NUDT Enzymes in Breast Cancer	<a href="https://www.mdpi.com/1422-0067/22/5/2267">https://www.mdpi.com/1422-0067/22/5/2267</a>
NUP98						Likely oncogenic	interacting with PARP1 in ovarian cancer	<a href="https://doi.org/10.3389/fonc.2022.880643">04670-7</a>
PALB2	1				2	Likely oncogenic	clinical implications	<a href="https://doi.org/10.3389/fonc.2022.880643">cancer.biomedcentral.com/articles/10.1186/s12943-022-0067-2</a>
PBK							TRIM37/NFκB axis in ovarian cancer	<a href="https://doi.org/10.3389/fonc.2022.880643">00809-w</a>
POLE						Likely oncogenic	Colorectal, Pancreatic, Non-Small Cell Lung and Prostate Cancers, and the Mechanisms of Resistance to PARP	<a href="https://www.frontiersin.org/journals/oncology/articles/10.3389/fonc.2022.880643/full">https://www.frontiersin.org/journals/oncology/articles/10.3389/fonc.2022.880643/full</a>
POT1						Likely oncogenic	Cells	<a href="https://doi.org/10.3389/fonc.2022.880643">S0962892419301242</a>
PTPN11		Dx2				Likely oncogenic	Resistance to Targeted Cancer Drugs	<a href="https://doi.org/10.3389/fonc.2022.880643">reports/pdfExtended/S2211-1247(15)00922-5</a>
RABL3							Inhibitor-Resistant Breast Cancer Cells	<a href="https://www.mdpi.com/1422-0067/21/16/5841">https://www.mdpi.com/1422-0067/21/16/5841</a>
RAD50						Likely oncogenic	Mutated Breast Cancer and New Therapeutic Approaches	<a href="https://www.mdpi.com/2072-6694/15/14/3642">https://www.mdpi.com/2072-6694/15/14/3642</a>
RBM15		Dx1				Oncogenic	methylation in breast cancer	<a href="https://doi.org/10.3389/fonc.2022.880643">61983/</a>
REL							Antineoplastic Drugs	<a href="https://www.mdpi.com/1422-0067/18/10/2111">https://www.mdpi.com/1422-0067/18/10/2111</a>
SDHA						Likely oncogenic	Ability, and Cancer Stem Cell Properties through	<a href="https://www.mdpi.com/1422-0067/23/21/12875">https://www.mdpi.com/1422-0067/23/21/12875</a>
SRSF2	4	Dx2	Px1		3	Oncogenic	Aberrant alternative splicing in breast cancer	<a href="https://doi.org/10.3389/fonc.2022.880643">5486617</a>
STAG2		Dx2				Likely oncogenic	creates a targetable synthetic lethality in cohesin-mutant	<a href="https://doi.org/10.3389/fonc.2022.880643">09659-z</a>
STAG3							confers resistance to BRAF inhibition in melanoma.	<a href="https://www.nature.com/articles/nm.4155">https://www.nature.com/articles/nm.4155</a>
TERT						Oncogenic	transcriptase (TERT/hTERT) in breast cancer	<a href="https://doi.org/10.3389/fonc.2022.880643">1186/s12964-023-01244-8</a>
TOP1						Likely oncogenic	Determines the Efficacy of Subsequent Chemotherapy	<a href="https://www.mdpi.com/2072-6694/12/2/334">https://www.mdpi.com/2072-6694/12/2/334</a>
WEE1							immune response in BRCA1/2 wildtype triple-negative	<a href="https://doi.org/10.3389/fonc.2022.880643">00568-5</a>

**Supplementary Table 9.** Independent validation of selected genes. The genes selected as significant using the correlation analysis have been checked against OncoKB annotations and published literature in the context of PARP inhibition. Each of the 5 levels of OncoKB are assigned a label. The lower the number the higher the evidence and confidence in a particular biomarker (i.e. therapeutic level 1 corresponds to "FDA-recognised biomarker predictive of response to an FDA-approved drug" whereas level 4 corresponds to "compelling biological evidence supports the biomarker as benign predictive").



PDX	Complete responder %	Initial responder %	Non-responder %	Final classification
PDX060	0	1	99	Non-responder
PDX127	0	92	8	Initial responder
PDX156	0	0	100	Non-responder
STG316	0	97	3	Initial responder
PDX288	0	2	98	Non-responder
PDX094	0	0	100	Non-responder
PDX221	0	0	100	Non-responder
PDX124	0	1	99	Non-responder
PDX179	0	0	100	Non-responder
PDX230	99	0	1	Completer responder
PDX405T	99	0	1	Completer responder
STG139	0	0	100	Non-responder
PDX549	0	0	100	Non-responder
PDX274	0	1	99	Non-responder
PDX102	0	0	100	Non-responder
PDX341	0	95	5	Initial responder
PDX302	99	0	1	Completer responder
PDX332	0	98	2	Initial responder
PDX252	0	1	99	Non-responder
PDX270	0	1	99	Non-responder
PDX236	0	95	5	Initial responder
PDX339	0	1	99	Non-responder
PDX291B	0	95	5	Initial responder
PDX335	0	1	99	Non-responder
PDX432	0	76	24	Initial responder
PDX384	1	98	1	Initial responder
PDX377	99	0	1	Completer responder

**Supplementary Table 10.** PDX classification. The final classification of each PDX is given by the consensus of the classifications of the mice that comprising each PDX. The percentages represent the portion of mice classified as complete, partial or non-responders in each PDX.