

**Table S1. Response Category**

Response Category	Best Response (%)
CR	<-95%
PR	[-95%, -50%)
PR>SD	[-50%, 0%)
SD	[0%, 35%)
SD>PD	[35%, 100%)
PD	Others

CR,complete remission; PR, partial remission; SD, stable disease; PD, progression disease.

**Table S2. Drug efficacy of PDX**

No.	Niraparib	Olaparib	TC
1	No	-	Yes
2	No	No	No
3	No	-	Yes
4	Yes	-	No

5	No	Yes	Yes
6	No	-	Yes
7	Yes	Yes	-
8	Yes	-	Yes
9	No	-	Yes
10	Yes	-	Yes
11	No	No	Yes
12	Yes	Yes	-
13	No	-	No
14	Yes	-	-
15	Yes	-	Yes
16	Yes	-	Yes
17	Yes	No	Yes
18	No	No	Yes
19	No	No	-
20	Yes	Yes	Yes
21	Yes	Yes	Yes
22	Yes	Yes	Yes
23	No	No	Yes
24	Yes	Yes	-
25	Yes	Yes	-
26	Yes	Yes	-

27	Yes	Yes	-
28	Yes	Yes	Yes
29	Yes	Yes	Yes
30	Yes	Yes	-
31	No	Yes	-
32	Yes	Yes	No
33	Yes	No	-
34	-	Yes	-
35	Yes	Yes	-
36	No	Yes	-
37	Yes	Yes	Yes
38	No	-	-
39	No	-	-
40	No	No	-

No, invalid (mSD>RD+mPD); Yes, valid (mSD+mPR>SD+mPR+mCR); TC, Paclitaxel and carboplatin.

**Table S3. Survival data of patients using PARPi as first- of second-line maintenance therapy.**

First-line maintenance					Second-line maintenance				
N	therapy			PDX's	therapy			PDX's response	
O	PARPi	Recu	PFS	response	PARPi	Recur	PFS		
	r-rent	(Month)			-rent	(Month)			
2	niraparib	Yes	10	Non-Response	niraparib	Yes	6	Non-Response	

5	olaparib	No	42	Response	-	-	-	-
7	olaparib	Yes	38	Response	-	-	-	-
8	olaparib	No	16	Response	-	-	-	-
15	niraparib	Yes	21	Response	olaparib	No	24	Response
16	olaparib	Yes	21	Response	olaparib	Yes	18	Response
17	niraparib	No	37	Response	-	-	-	-
18	niraparib	Yes	13	Non-Response	olaparib	Yes	16	Non-Response
20	niraparib	Yes	28	Response	olaparib	No	10	Response
21	niraparib	No	27	Response	-	-	-	-
22	olaparib	Yes	23	Response	niraparib	Yes	12	Response
24	olaparib	No	27	Response	-	-	-	-
29	-	-	-	-	olaparib	Yes	17	
30	niraparib	Yes	16	Response	-	-	-	-
31	-	-	-	-	niraparib	No	8	Non-Response
37	-	-	-	-	olaparib	No	7	Response

**Table S4. The comparison of gene amplification between response and non-response groups.**

Gene	P-value	Odds_ratio	Percentage_Response	Percentage_No_Response	FDR
		o	se	nse	
PAX8	0.116615	inf	0.333333	0	1
NKX2-1	0.116615	inf	0.333333	0	1
SOX2	0.167468	5	0.75	0.375	1

CDKN2A	0.324561	5	0.416667	0.125	1
BRCA1	0.347265	0.333333	0.166667	0.375	1
MYC	0.347265	3	0.833333	0.625	1
MDM2	0.356347	0.333333	0.25	0.5	1
CCND1	0.356347	0.333333	0.25	0.5	1
CDKN1B	0.372851	0.333333	0.5	0.75	1
NF1	0.4	0	0	0.125	1
STK11	0.494737	inf	0.166667	0	1
ERBB2	0.536842	0.272727	0.083333	0.25	1
ATM	0.642415	0.555556	0.25	0.375	1
CDK4	0.647916	0.5	0.333333	0.5	1
BCL2L1	0.647916	2	0.666667	0.5	1
KRAS	0.647916	2	0.666667	0.5	1
E2F3	0.669921	0.6	0.5	0.625	1
IKZF2	0.669921	1.666667	0.5	0.375	1
MLL3	1	1	0.5	0.5	1

**Table S5. The comparison of gene deletion between response and non-response groups.**

Gene	<i>P-value</i>	Odds_ratio	Percentage_	Percentage_No_	<i>FDR</i>
			Response	Response	
AKT1	0.014654	inf	0.583333	0	0.5129
KRAS	0.049123	0	0	0.375	0.566802
NF1	0.062332	8.333333	0.833333	0.375	0.566802

SMAD4	0.064777	9	0.75	0.25	0.566802
PDGFRA	0.161094	0.2	0.166667	0.5	0.837342
ERBB2	0.161094	5	0.833333	0.5	0.837342
CDKN2A	0.167468	0.2	0.25	0.625	0.837342
MDM4	0.347265	0.333333	0.166667	0.375	1
CCND1	0.494737	inf	0.166667	0	1
IGF1R	0.536842	0.272727	0.083333	0.25	1
MYCN	0.536842	0.272727	0.083333	0.25	1
CCNE1	0.536842	0.272727	0.083333	0.25	1
E2F3	0.536842	0.272727	0.083333	0.25	1
NEDD9	0.536842	0.272727	0.083333	0.25	1
CDK4	0.602683	3.5	0.333333	0.125	1
STK11	0.618576	0.428571	0.75	0.875	1
MLL3	0.618576	2.333333	0.25	0.125	1
CDK6	0.618576	2.333333	0.25	0.125	1
FAT1	0.618576	0.428571	0.75	0.875	1

**Table S6. The comparison of gene mutation between response and non-response groups.**

Gene	Odds_ratio	P-value	Percentage_Response	Percentage_No_Response	FDR
SYMPK	0.04	0.147368	0.0001	0.25	1
SELP	0.04	0.147368	0.0001	0.25	1
COL6A5	0.04	0.147368	0.0001	0.25	1

ABCB5	0.04	0.147368	0.0001	0.25	<i>I</i>
MTCL1	0.04	0.147368	0.0001	0.25	<i>I</i>
NF2	0.04	0.147368	0.0001	0.25	<i>I</i>
MUTYH	0.04	0.147368	0.0001	0.25	<i>I</i>
LRRK2	25	0.242105	0.25	0.0001	<i>I</i>
SI	25	0.242105	0.25	0.0001	<i>I</i>
EYS	25	0.242105	0.25	0.0001	<i>I</i>
KDM6A	0.04	0.4	0.0001	0.125	<i>I</i>
GRIN3A	0.04	0.4	0.0001	0.125	<i>I</i>
MS4A12	0.04	0.4	0.0001	0.125	<i>I</i>
GSG2	0.04	0.4	0.0001	0.125	<i>I</i>
HIST1H4D	0.04	0.4	0.0001	0.125	<i>I</i>
MYCBP2	0.04	0.4	0.0001	0.125	<i>I</i>
CYP2A13	0.04	0.4	0.0001	0.125	<i>I</i>
GLTPD2	0.04	0.4	0.0001	0.125	<i>I</i>
TRPM1	0.04	0.4	0.0001	0.125	<i>I</i>

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