Table S1. Cancer-related genes of 2 Immunotherapy Responders identified by ACTOnco 409 gene panel

	Tumor type	**Gene**	**Chr[3]**	**Cds[4] change**	**AA[5] change**	**Mutation frequency**
Case 1	HCC[1]	*TP53*	17	c. 743G>A	R248Q	25.6%
		TBX22	X	c.1122G>C	K374N	24.8%
		TRRAP	7	c.4949G>A	R1650Q	16.7%
		PRKDC	8	c.967-1G>T	Splice acceptor	15.7%
Case 2	GC[2]	*TP53*	17	c.892G>T	p.E298*	43%
		USP9X	X	c.1916C>T	p.P639L	15%
		IRS2	13	c.628A>G	p.S210G	62%
		PRKDC	8	c.1952A>T	p.Y651F	31%
		TCF12	15	c.427C>G	p.P143A	58%

[1]HCC: Hepatocellular carcinoma; [2]GC: Gastric cancer; [3]Chr: Chromosome; [4]Cds: codons; [5]AA: Amino acid

Table S2. Mutation Types and MSI status in Patients Harboring *PRKDC* mutation

Sample	Group	Variant	Chr	Type	Consequence	HGVSc	HGVSp
1	MSI-H	C>C/T	8	snv	splice_donor_variant	c.5234+1G>A	
2	MSI-H	G>G/A	8	snv	missense_variant	c.2753C>T	p.Ala918Val
3	MSI-H	C>C/T	8	snv	missense_variant	c.9865G>A	p.Gly3289Ser
4	MSI-H	C>C/G	8	snv	missense_variant	c.11414G>C	p.Gly3805Ala
5	MSI-H	C>C/T	8	snv	missense_variant	c.6694G>A	p.Asp2232Asn
6	MSI-H	C>C/T	8	snv	missense_variant	c.4697G>A	p.Arg1566Gln
7	MSI-H	G>G/T	8	snv	stop_gained	c.4157C>A	p.Ser1386Ter
8	MSI-H	CT>C T/C	8	deletion	frameshift_variant	c.8109delA	p.Gly2704AlafsTer?
9	MSS	T>T/C	8	snv	missense_variant,splice_region_variant	c.11491A>G	p.Ile3831Val

Table S3. *PRKDC* Mutation and MSI status in Patients with Various Cancer Types

Cancer type	# Sample	# MSI-H with *PRKDC* mutation	# MSS with PRKDC mutation	# MSI-H without PRKDC mutation	# MSS without PRKDC mutation
CESC	289	3	19	6	261
HNSC	507	3	25	6	473
LUAD	567	2	46	5	514
UCEC	530	61	28	110	331

CESC, cervical squamous cell carcinoma and endocervical adenocarcinoma; HNSC, head and neck squamous cell carcinoma; LUAD, lung adenocarcinoma; UCEC, uterine corpus endometrial carcinoma.

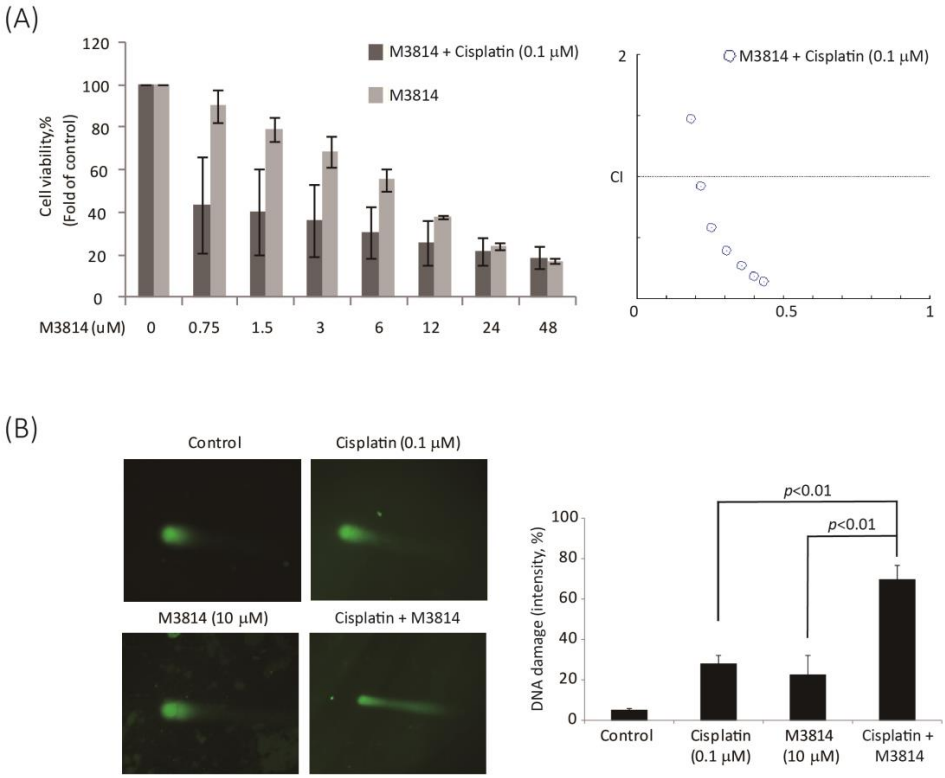

Figure S1. M3814 inhibited MGCC3I cell growth and increased DNA breaks.

(A) Drug sensitivities of MGCC3I cells were analyzed by MTT-based viability assays 48 hours after they were treated with indicated concentrations of M3814 and 1uM cisplatin. (B) MGCC3I cells treated with M3814 alone or combined with cisplatin increased DNA breaks analyzed by Comet assay.

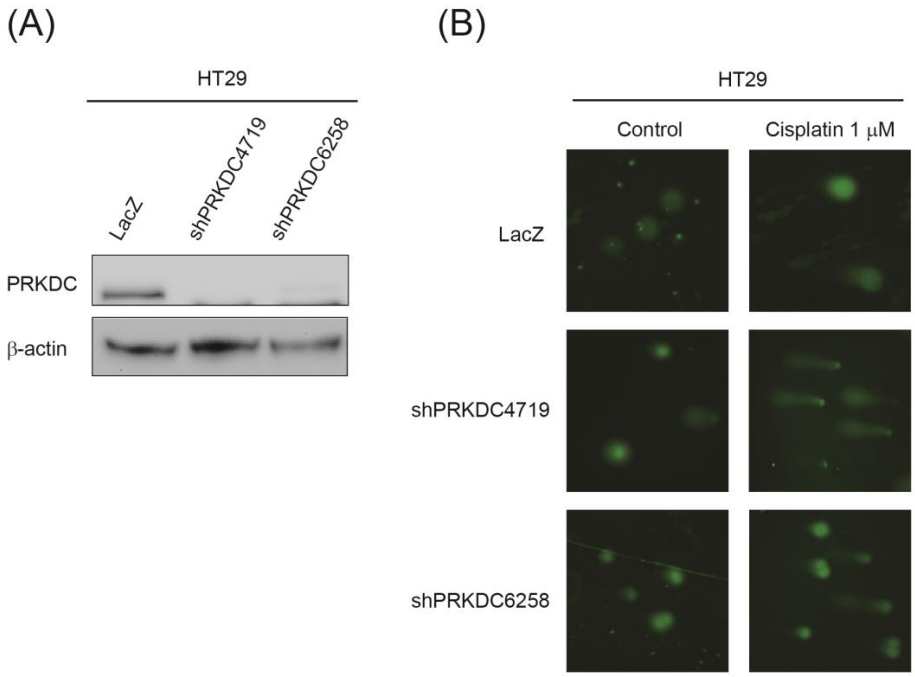

Figure S2. Knock-down *PRKDC* increased DNA breaks treated with cisplatin.

(A) HT29 cell lines with or without knock down-*PRKDC*. (B) knock-down *PRKDC* HT29 cells treated with cisplatin increased DNA breaks analyzed by Comet assay.