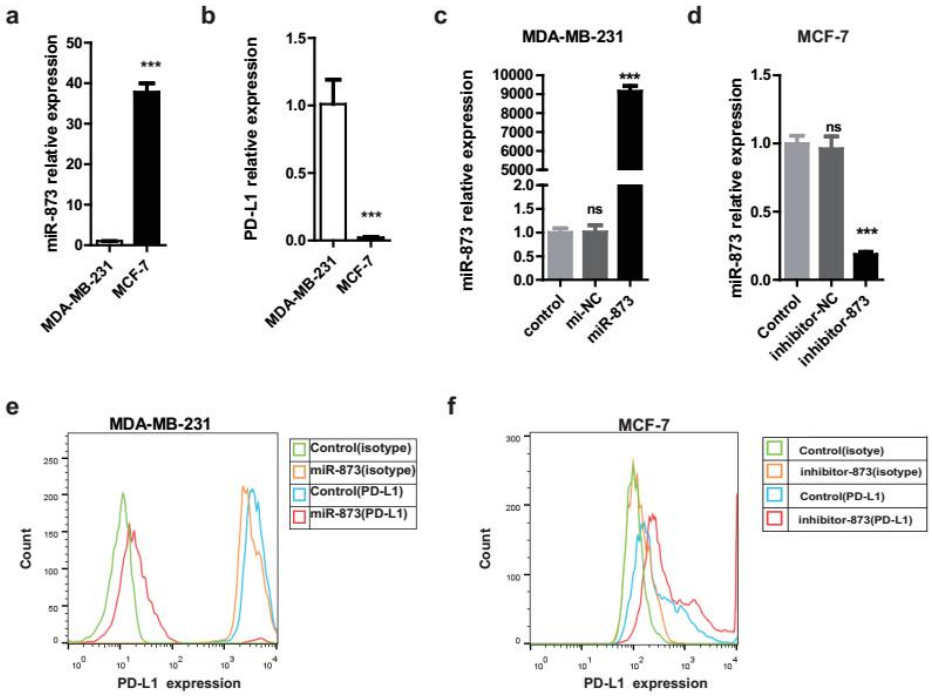

Figure. S1 Expression of PD-L1 and miR-873 and transfection efficiency of miR-873 (mimics or inhibitor) in breast cancer cells. (**a, b**) The expression of miR-873 and PD-L1 was evaluated in MDA-MB-231 or MCF-7 cells. (**c, d**) Transfection efficiency of miR-873 or inhibitor-873 in MDA-MB-231 or MCF-7 cells was measured by qRT-PCR. (**e, f**) MDA-MB-231 or MCF-7 cells were harvested, stained with APC-labeled anti-PD-L1 Ab or an isotype control, and PD-L1 expression was measured by flow cytometry. (Data were presented as the mean ± SD, n = 3. ***p < 0.001 vs Control group).

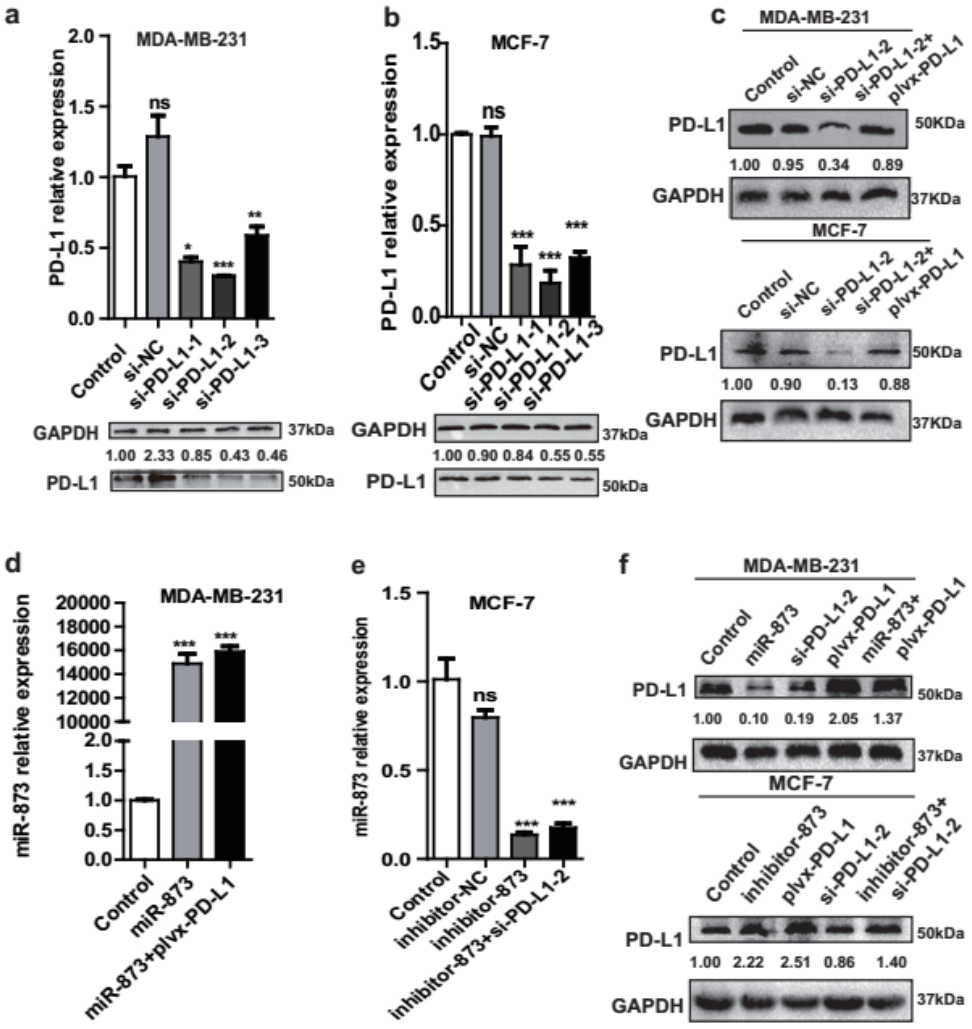

Figure. S2 Expression of PD-L1 and miR-873 in MDA-MB-231 and MCF-7 cells with different treatment. (**a, b**) Efficiency of siRNA-mediated knockdown of PD-L1 expression was evaluated in MDA-MB-231 and MCF-7 cells. (**c**) Effects of si-PD-L1-2-mediated knockdown of PD-L1 were specific in MDA-MB-231 or MCF-7 cells. (**d - f**) miR-873 and PD-L1 expression were confirmed by qRT-PCR and western blot in MDA-MB-231 or MCF-7 cells with different treatment shown in labels. (Data were presented as the mean ± SD, n = 3. *p < 0.05, **p < 0.01, ***p < 0.001 vs Control group).

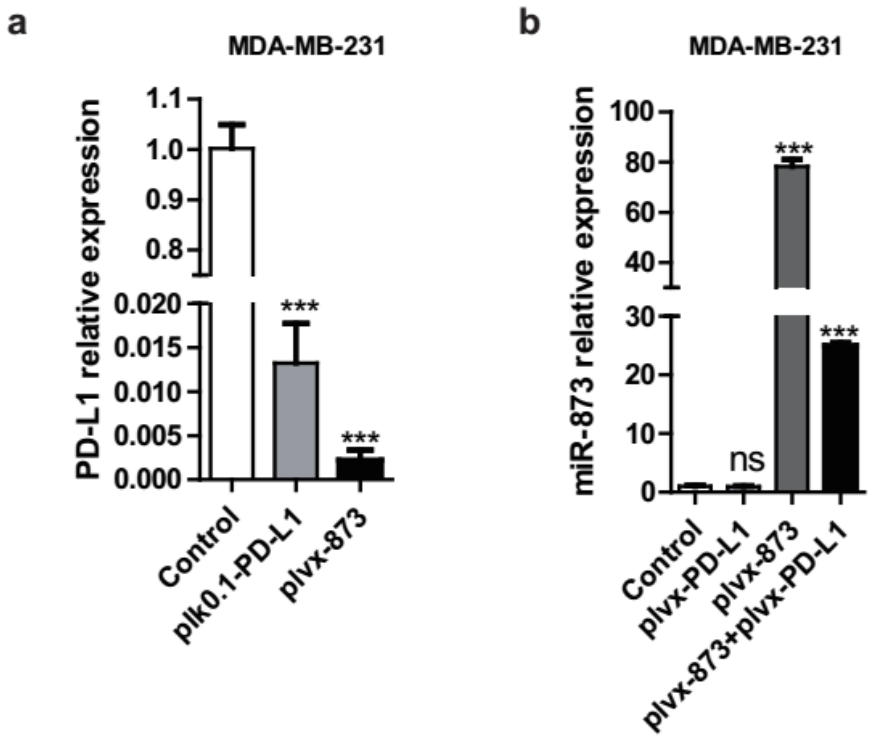

Figure. S3 Expression of PD-L1 and miR-873 in MDA-MB-231 cells with lentivirus infection. (**a, b**) Expression of PD-L1 and miR-873 was verified by qRT-PCR in MDA-MB-231 cells with plvx-873, Plko.1-PD-L1, and plvx-873 together with plvx-PD-L1 lentivirus infection. (Data were presented as the mean ± SD, n = 3. ***p < 0.001 vs Control group).

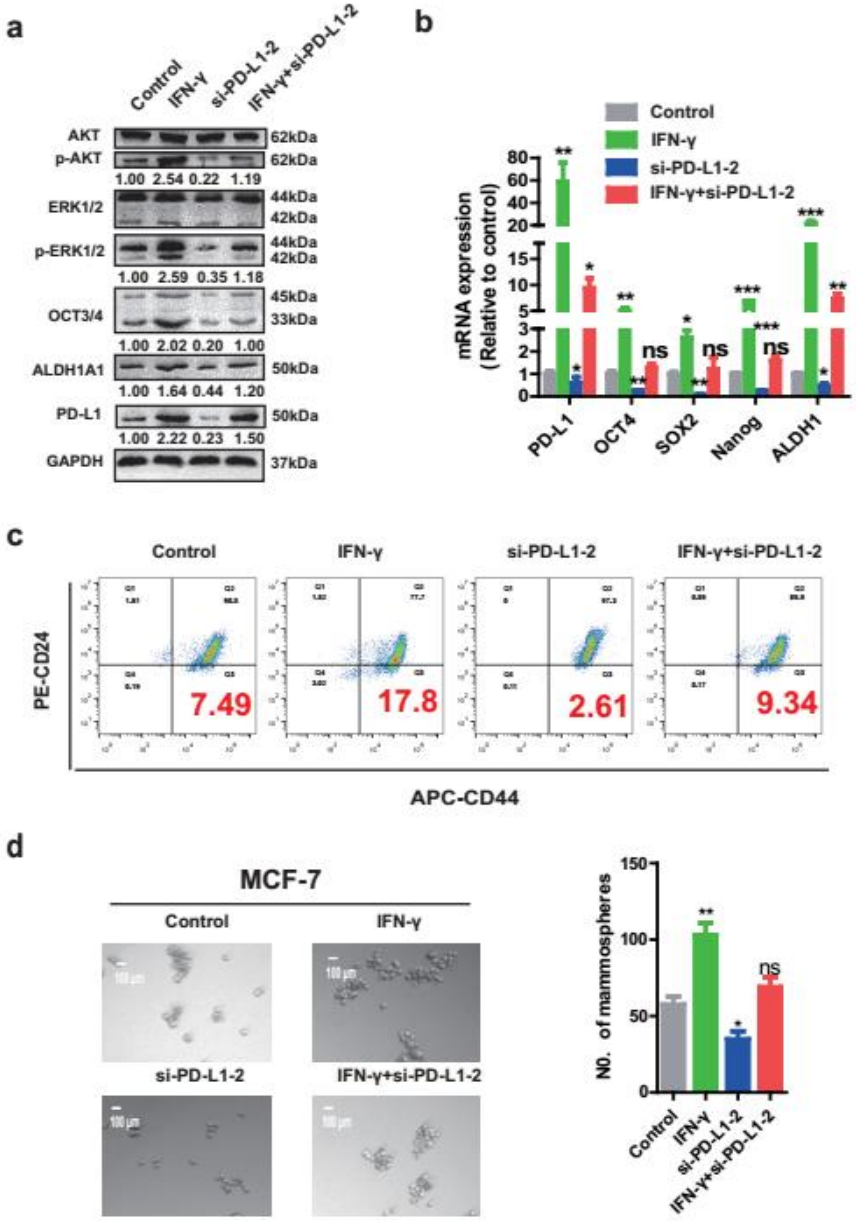

Figure. S4 IFN-γ increased the stemness signatures in MCF-7 cells. (a, b) Stemness markers (OCT4, SOX2, Nanog, ALDH1) and PD-L1 expression was detected in MCF-7 with IFN-γ or PD-L1 knockdown or IFN-γ plus PD-L1 knockdown. **(c, d)** Spheroid formation and CD44+/CD24- population were examined in cells depicted in (**a**). (Data were presented as the mean ± SD, n = 3. *p < 0.05, **p < 0.01, ***p < 0.001 vs Control group).

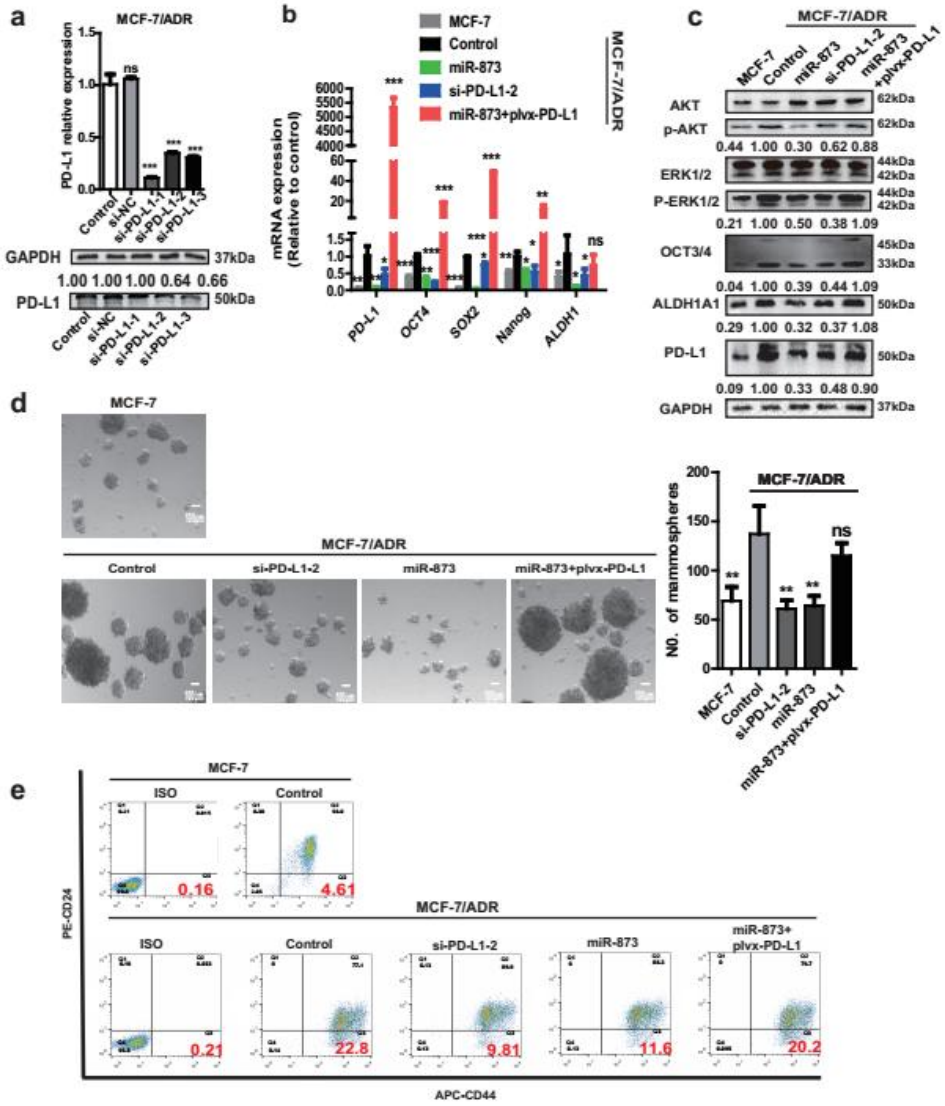

Figure. S5 Stemness signatures and drug resistance genes expression in MCF-7/ADR cells. (**a**) Efficiency of siRNA-mediated knockdown of PD-L1 expression in MCF-7/ADR cells was tested. (**b, c**) Stemness markers (OCT4, SOX2, Nanog, ALDH1) and PD-L1 expression was detected in MCF-7, and MCF-7/ADR cells with miR-873 overexpression or PD-L1 knockdown or miR-873 overexpression plus PD-L1 overexpression by qRT-PCR and western blot. (**d, e**) Spheroid formation

and CD44+/CD24- population were examined in cells depicted in (**b**). (Data were presented as the mean ± SD, n = 3. *p < 0.05, **p < 0.01, ***p < 0.001 vs Control group).

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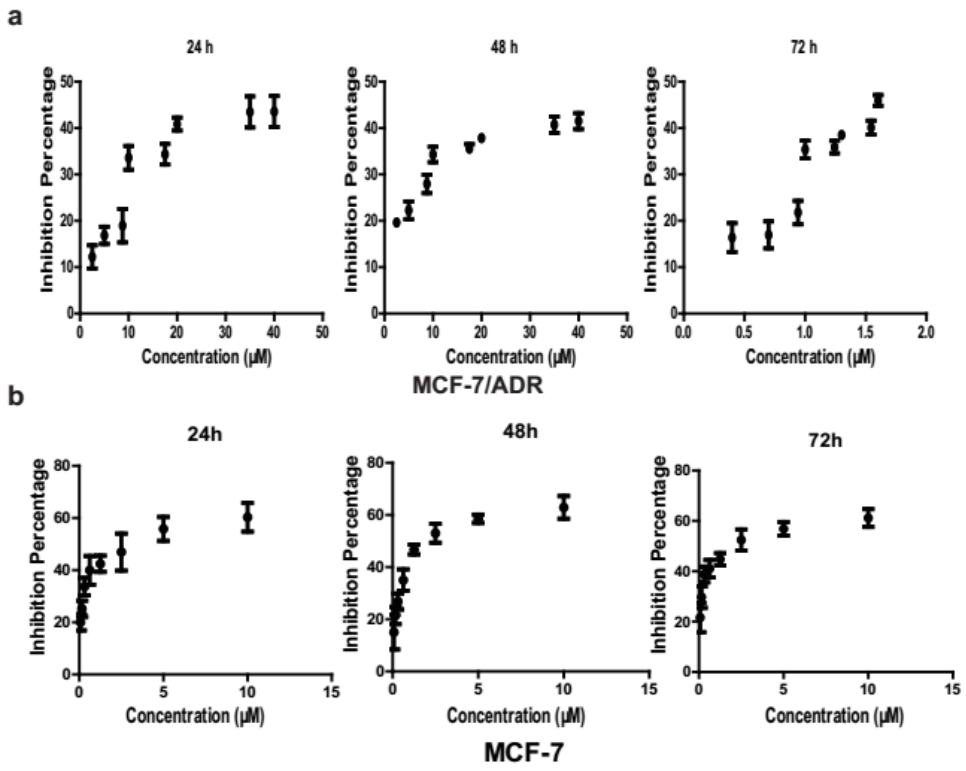

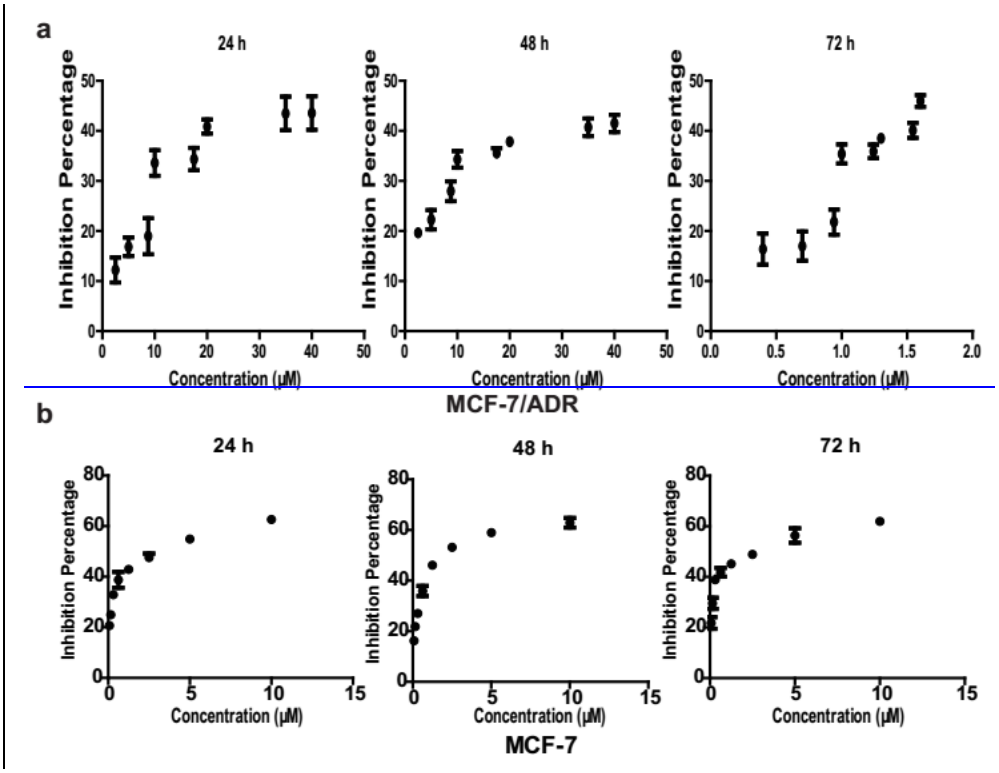

Figure. S6 MTT assay was performed to detect inhibition percentage after exposure adriamycin in MCF-7 and MCF-7/ADR. (**a**) After MCF-7/ADR cells were treated with adriamycin at 0, 2.5, 5, 8.75, 10, 17.5, 20 and 35 uM for 24 h, 48 h, 72 h, inhibition percentage of adriamycin was measured. (**b**) MCF-7 cells were treated with adriamycin at 0, 0.078125, 0.15625, 0.3125, 0.625, 1.25, 2.5, 5 and 10 uM for 24 h, 48 h, 72 h, then inhibition percentage was measured.

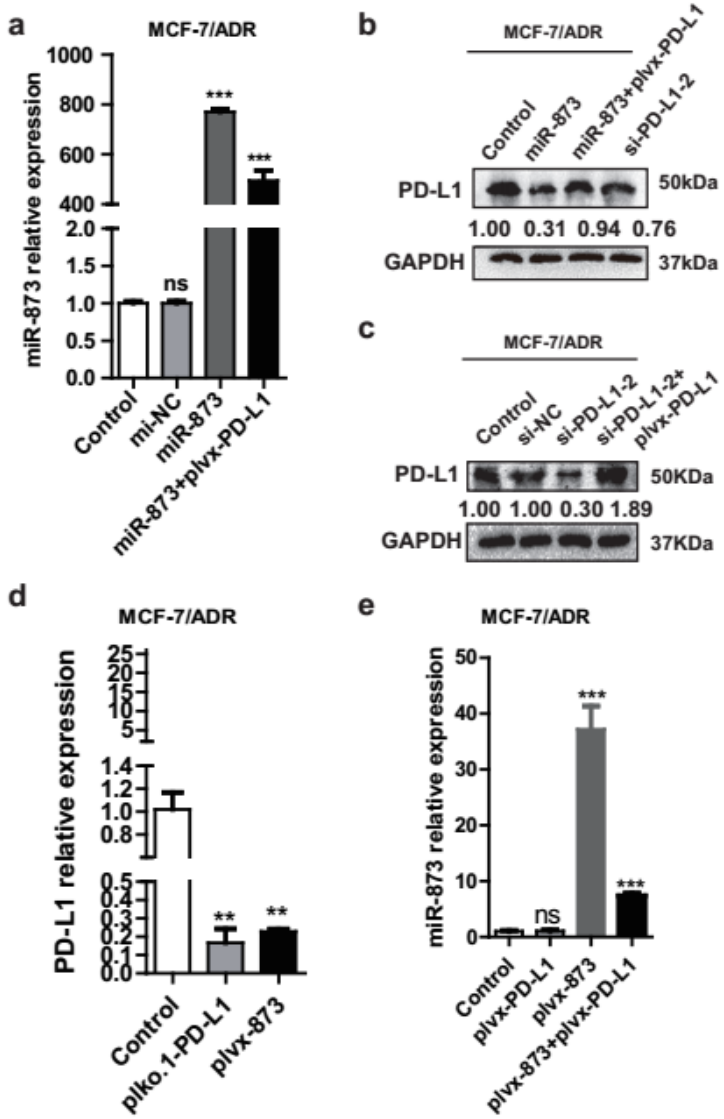

Figure. S7 Expression of PD-L1 and miR-873 in MCF-7/ADR cells with different treatment was tested. (**a, b**) miR-873 and PD-L1 expression was detected in MCF-7/ADR cells with miR-873 overexpression as well as PD-L1 overexpression or not, or PD-L1 knockdown. (**c**) Effects of si-PD-L1-2-mediated knockdown of PD-L1 were specific in MCF-7/ADR cells. (**d, e**) Expression of PD-L1 and miR-873 was measured in MCF-7/ADR cells with miR-873 overexpression or PD-L1 knockdown, or miR-873 overexpression plus PD-L1 overexpression via lentivirus infection. (Data were presented as the mean ± SD, n = 3. **p < 0.01, ***p < 0.001 vs Control group).

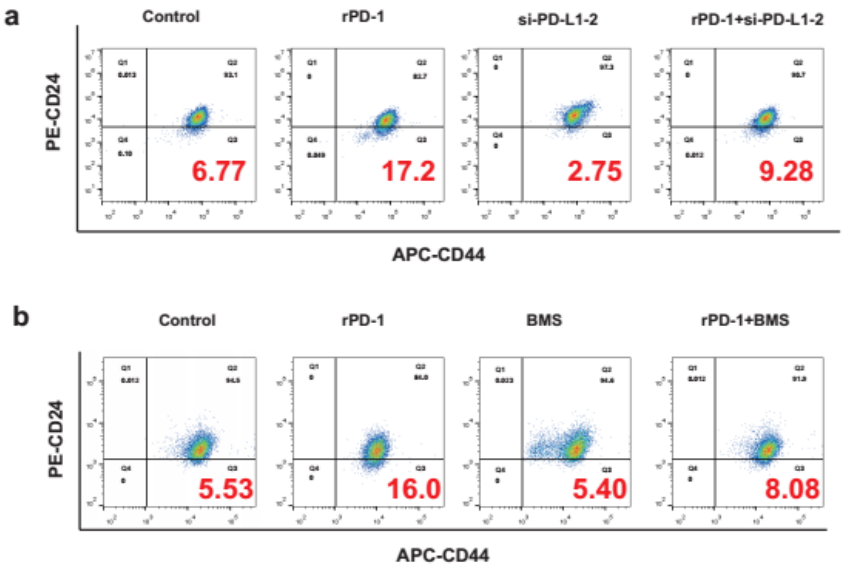

Figure. S8 The effect of rPD-1 to stemness was through PD-L1. MCF-7 cells were pretreated with **(a)** si-PD-L1-2 and **(b)** 10 μM BMS-202, and then cultured in the absence or presence of rPD-1 (0.5 ug/ml) for 24 h, CD44+/CD24- populations was measured by flow cytometry.

Supplementary Table 1. Sequences of siRNA, mimics (miR-873) and inhibitor

Name		Sequences
si-PD-L1-1	Forward (5'-3')	GGAUAAGAACAUUAUUCAAdTdT
	Reverse (5'-3')	UUGAAUAAUGUUCUUAUCCdTdT
si- PD-L1-2	Forward (5'-3')	GGUGCCGACUACAAGCGAAdTdT
	Reverse (5'-3')	UUCGCUUGUAGUCGGCACCdTdT
si-PD-L1-3	Forward (5'-3')	GGAGAAUGAUGGAUGUGAAdTdT
	Reverse (5'-3')	UUCACAUCCAUCAUUCUCCdTdT
miR-873	Forward (5'-3')	GCAGGAACUUGUGAGUCUCCU
	Reverse (5'-3')	AGGAGACUCACAAGUUCCUGC
inhibitor-873	Reverse (5'-3')	AGGAGACUCACAAGUUCCUGC

Supplementary Table 2. Sequences of primers used for plasmid constructions.

Name		Sequences
plvx-PD-L1	Forward (5’-3’)	CCGGAATTCGGCATTCCAGAAAGATGAGGATATT
	Reverse (5’-3’)	AAGGAAAAAAGCGGCCGCTTGTCACGCTCAGCCCCGAT
pMIR-PD-L1 3’UTR(WT)	Forward (5’-3’)	CCCAAGCTTGGCATCCAAGATACAAACTCAAAG
	Reverse (5’-3’)	CGACGCGTATCATCTCTGCCTATGCCATTTAC
pMIR-PD-L1 3’UTR(MUT)	Forward (5’-3’)	GTCCAGGTTCACAGAAGTGCCCTTTGCCTCCAC
	Reverse (5’-3’)	ACTTCTGTGAACCTGGACCCTCAAATTAGGGATTCTCAA
pcDNA3.1(+) PD-L1 3’UTR（WT）	Forward (5’-3’)	TAGTCCAGTGTGGTGGAATTCTCCAGCATTGGAACTTCTGATCT
	Reverse (5’-3’)	GCCCTCTAGACTCGAGCGGCCGCTTTTTTAACTTTCTCCACTGGGATG
pcDNA3.1(+) PD-L1 3’UTR (MUT)	Forward (5’-3’)	GTCCAGGTTCACAGAAGTGCCCTTTGCCTCCAC
	Reverse (5’-3’)	ACTTCTGTGAACCTGGACCCTCAAATTAGGGATTCTCAA
plvx-873	Forward (5’-3’)	GGATCTATTTCCGGTGAATTCGGATGCTCAATCAATATTTATTGAATACA
	Reverse (5’-3’)	AGAGGGGCGGGATCCGCGGCCGCAACACCTCAAGTAAACCTACTGACATCC
Plko.1-PD-L1	Forward (5’-3’)	CCGGGGAGAATGATGGATGTGAACTCGAGTTCACATCCATCATTCTCCTTTTTG
	Reverse (5’-3’)	AATTCAAAAAGGAGAATGATGGATGTGAACTCGAGTTCACATCCATCATTCTCC

Supplementary Table 3. Primary antibodies used in this study.

Antigens	Manufacturer	Application
GAPDH	Yifeixue	1:5000
β-actin	Yifeixue	1:5000
PD-L1	Proteintech	1:5000
P-gp	Proteintech	1:1000
p-AKT-s473	Proteintech	1:1000
p-ERK1/2 (Thr202/Tyr204)	Wanlei	1:1000
AKT	Wanlei	1:1000
ERK1/2	Wanlei	1:1000
OCT3/4	Wanlei	1:1000
ALDH1A1	Proteintech	1:1000

Supplementary Table 4. Sequences of primers used for qRT-PCR in this study

Name		Sequences
PD-L1	Forward (5’-3’)	TGGCATTTGCTGAACGCATTT
	Reverse (5’-3’)	TGCAGCCAGGTCTAATTGTTTT
GAPDH	Forward (5’-3’)	ACAACTTTGGTATCGTGGAAGG
	Reverse (5’-3’)	GCCATCACGCCACAGTTTC
FGF-7	Forward (5’-3’)	TGACTCCAGAGCAAATGGCTACAA
	Reverse (5’-3’)	CCTTTTACTTTGCCTCTTTTATCG
ABCC3	Forward (5’-3’)	GGCTTTCTCTCCCGCCTGTT
	Reverse (5’-3’)	TTGTGTCGTGCCGTCTGCTT
ALDH1	Forward (5’-3’)	AGCCTTCACAGGATCAACAGA
	Reverse (5’-3’)	GTCGGCATCAGCTAACACAA
Nanog	Forward (5’-3’)	GCAGGCAACTCACTTTATCC
	Reverse (5’-3’)	CCCACAAATCACAGGCATAG
OCT4	Forward (5’-3’)	AGCGATCAAGCAGCGACTA
	Reverse (5’-3’)	GGAAAGGGACCGAGGAGTA
SOX2	Forward (5’-3’)	CATCACCCACAGCAAATGAC

Reverse (5’-3’)	CAAAGCTCCTACCGTACCACT