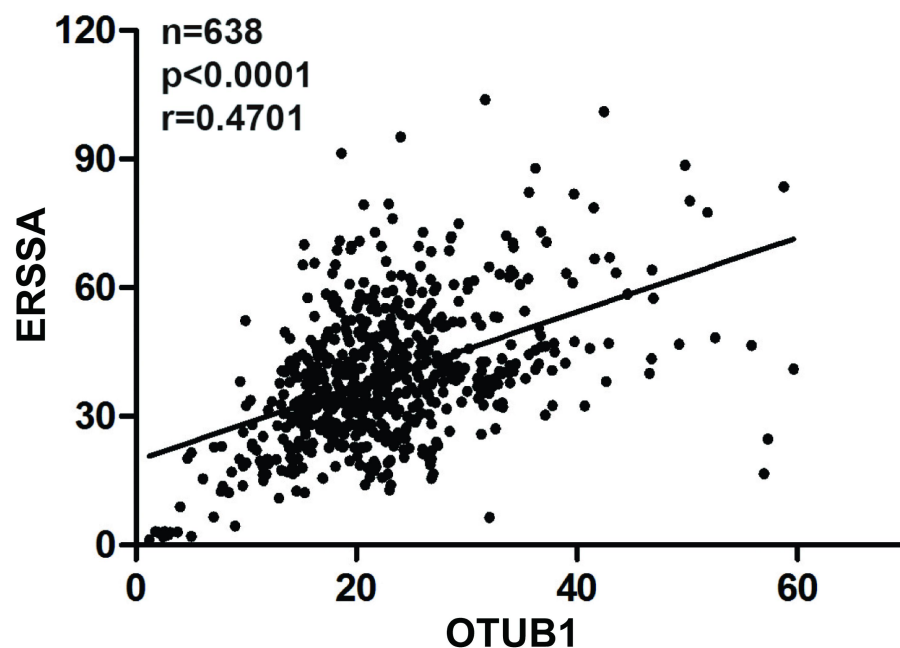


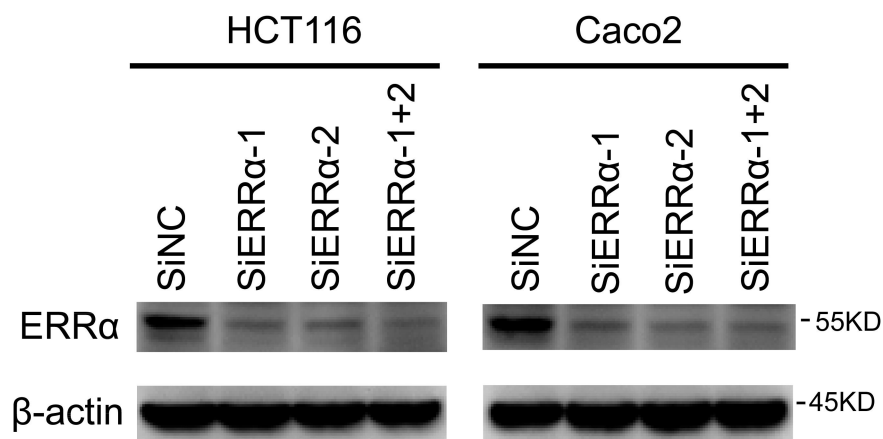
## Supplementary Figures

### Supplementary Figure S1



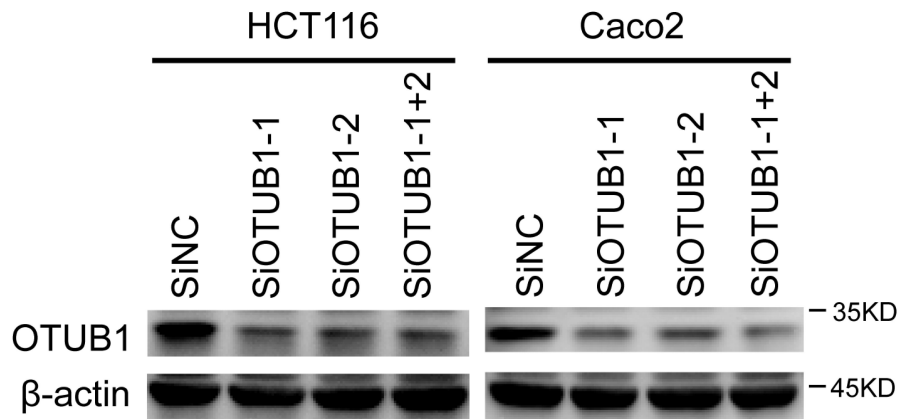
**Figure S1. The expression of ERR $\alpha$  and OTUB1 correlate in CRC.** Correlation analysis relative to the expression of ERR $\alpha$  and OTUB1 in 638 patients with CRC in the TCGA database.

### Supplementary Figure S2



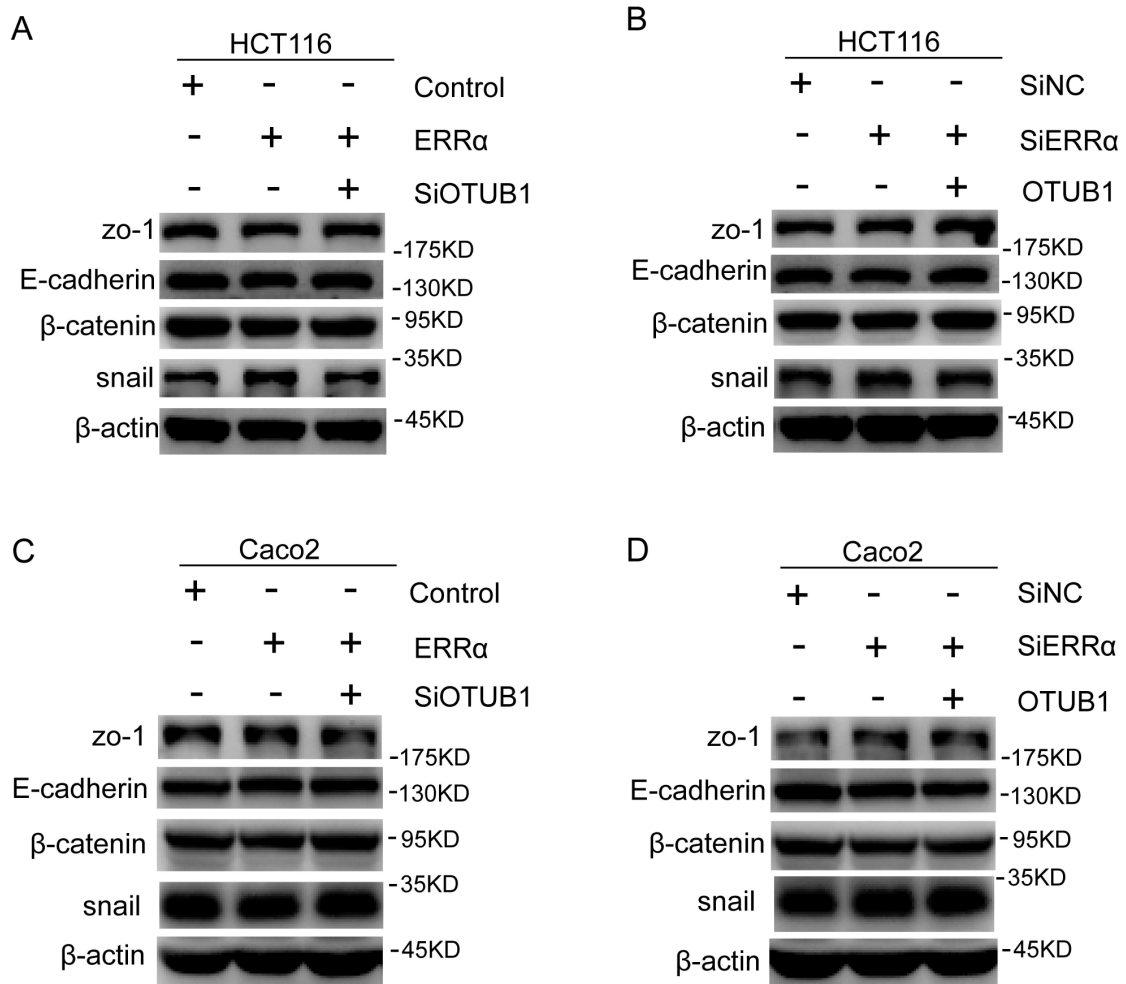
**Figure S2. ERR $\alpha$  knock down by siRNA.** Two siRNAs targeting ERR $\alpha$  were transfected alone or together into HCT116 or Caco2 cells for 48 h. ERR $\alpha$  levels were quantified by western blot.

### Supplementary Figure S3



**Figure S3. OTUB1 knock down by siRNA.** Two siRNAs targeting OTUB1 were transfected alone or together into HCT116 or Caco2 cells for 48 h. OTUB1 were quantified by western blot.

**Supplementary Figure S4**



**Figure S4. ZO-1, E-cadherin, β-catenin and snail were not regulated by ERRα.** HCT116 (A) or Caco2 (C) cells were transfected with ERRα expression plasmid (or empty vector) with or without OTUB1 siRNAs for 48 h. HCT116 (B) or Caco2 (D) cells were transfected with an ERRα siRNA (or siNC) with or without OTUB1 expression plasmid for 48 h. The protein levels of ZO-1, E-cadherin, β-catenin, and snail were measured by

western blot.

## Supplementary tables

**Table S1. The primers were used for cloning OTUB1 promoter**

promoter	primer	sequence
-1000/+1000	forward	5'-TATACGCGTAAACCAGAAGGACACAGA-3'
	reverse	5'-TCCAGATCTAGGCGTGGTCTCTTGCAG-3'
+339/+1000	forward	5'-TATACGCGTCCGCGTAGGTCATTGGGT-3'
	reverse	5'-TCCAGATCTAGGCGTGGTCTCTTGCAG-3'
+485/+1000	forward	5'-TATACGCGTACCGAACACTTGAGGGAA-3'
	reverse	5'-TCCAGATCTAGGCGTGGTCTCTTGCAG-3'
+658/+1000	forward	5'-TATACGCGTCGTAAGGATGCCTCTA-3'
	reverse	5'-TCCAGATCTAGGCGTGGTCTCTTGCAG-3'
+900/+1000	forward	5'-TATACGCGTGGATGAAGGCGGTGATGGA-3'
	reverse	5'-TCCAGATCTAGGCGTGGTCTCTTGCAG-3'
ERRE-S1 mutation	Forward-1	5'-TATACGCGTAAACCAGAAGGACACAGA-3'
	Reverse-1	5'-ATCCCTTGGTGGCTCTCAAGAAGCCTCATGACCTAACT-3'
	Forward-2	5'-GGCTTCTTGAGAGCCACCAAGGGATGCTGTCT-3'
	Reverse-2	5'-TCCAGATCTAGGCGTGGTCTCTTGCAG-3'
ERRE-S2 mutation	Forward-1	5'-TATACGCGTCCGCGTAGGTCATTGGGT-3'
	Reverse-1	5'-GACTTGATCTCAAGACCCTTTTGGGGCTCGCC-3'
	Forward-2	5'-AGGGTCTTGAGATCAAGTCATTCAGCCCACGC-3'
	Reverse-2	5'-TCCAGATCTAGGCGTGGTCTCTTGCAG-3'
ERRE-S3 mutation	Forward-1	5'-TATACGCGTACCGAACACTTGAGGGAA-3'
	Reverse-1	5'-TAATCTTGAGAGCCAAGTCCCTTCCGGGGC-3'
	Forward-2	5'-CTTGTGCTCTCAAGCATTAAAGAGAGCCAGG-3'
	Reverse-2	5'-TCCAGATCTAGGCGTGGTCTCTTGCAG-3'
ERRE-S4 mutation	Forward-1	5'-TATACGCGTCGTAAGGATGCCTCTA-3'
	Reverse-1	5'-TCTGCGCTCTCAAGCCAACTAGCAAAAGACCTGC-3'
	Forward-2	5'-AGTTGCTTGAGAGCGCAGATTGCTTACCTGTC-3'
	Reverse-2	5'-TCCAGATCTAGGCGTGGTCTCTTGCAG-3'

**Table S2. The potential ERR $\alpha$  response elements of OTUB1 promoter -1000 to +1000**

Model name	Score	Relative score	Start	End	Strand	predicted site sequence
ESRRA	14.251	0.924712	815	823	-1	TCAAGGTCA
ESRRA	11.482	0.890292	447	455	-1	TAAAGGTCA
ESRRA	8.989	0.859303	-958	-950	-1	TCAAGGCCA
ESRRA	4.546	0.804075	538	546	1	TCAAGATGA