

Figure S1. Flow chart to present the experimental design of the present study.

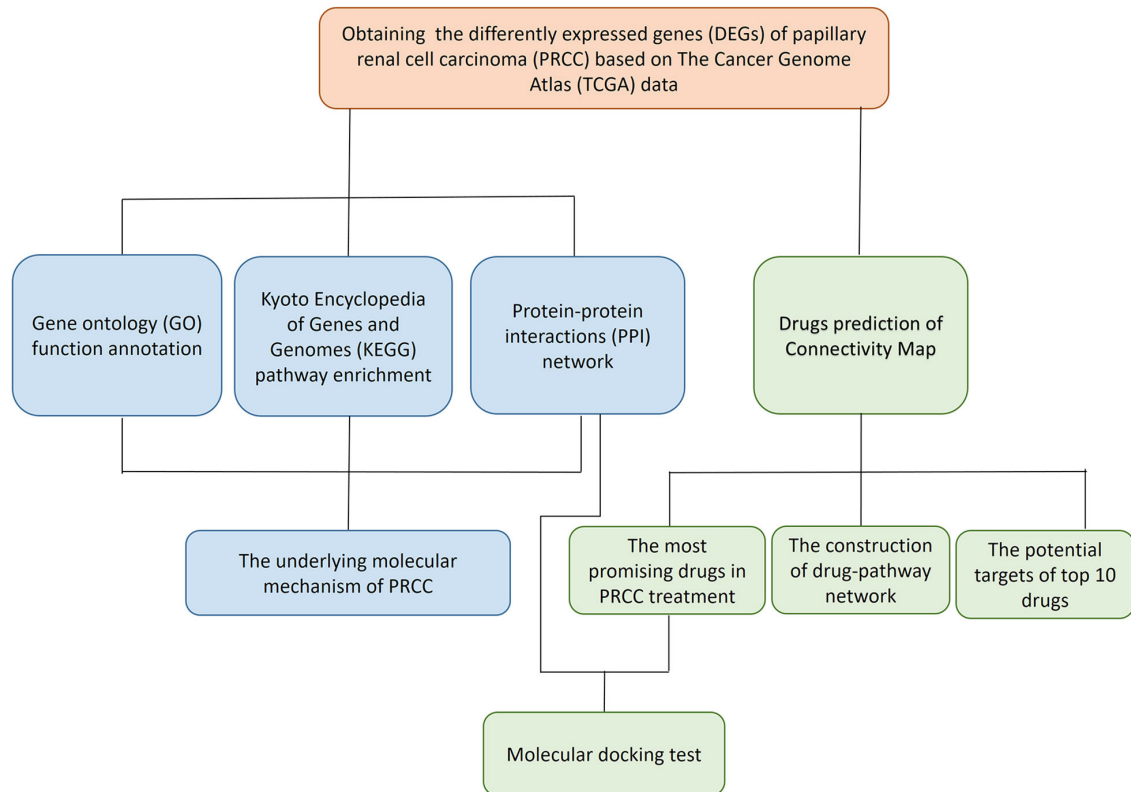


Figure S2. Volcano plot showing the differentially expressed genes between papillary renal cell carcinoma and non-cancer adjacent samples.

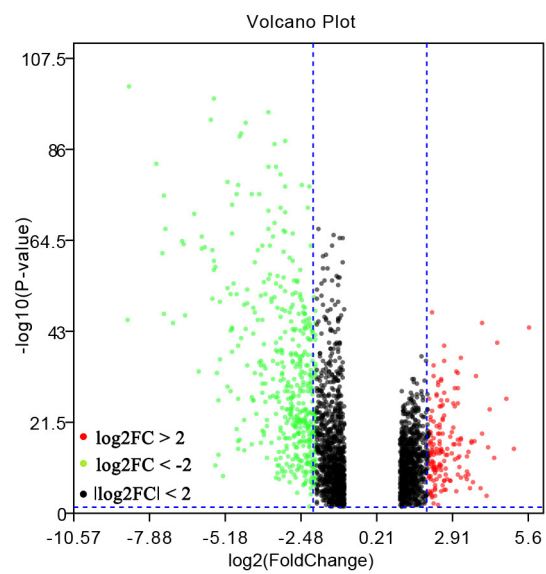
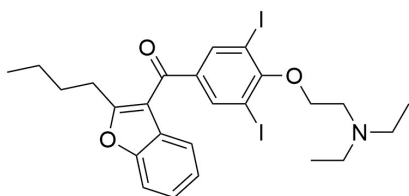
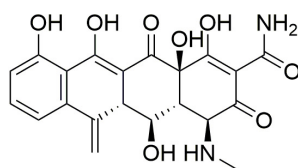


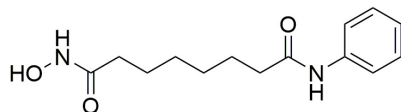
Figure S3. The 2D molecular structures of the top 10 drugs.



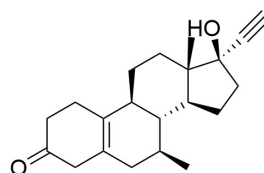
Amiodarone (C₂₅H₂₉I₂NO₃)



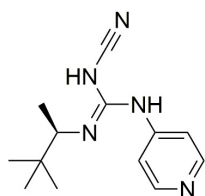
Metacycline (C₂₂H₂₂N₂O₈)



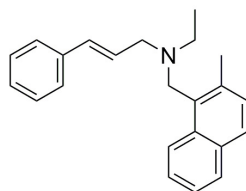
Vorinostat (C₁₄H₂₀N₂O₃)



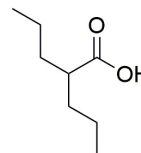
Noretynodrel (C₂₀H₂₆O₂)



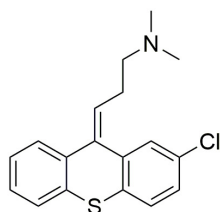
Pinacidil (C₁₃H₁₉N₅)



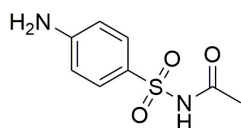
Naftifine (C₂₁H₂₁N)



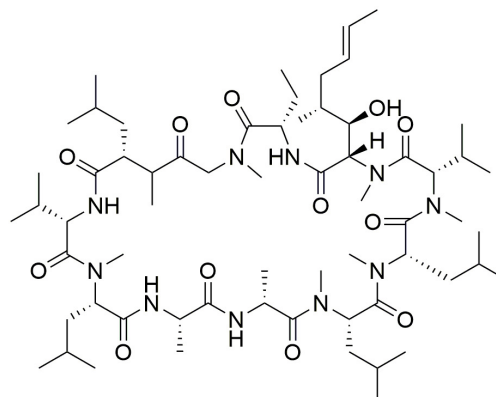
Valproic acid (C₈H₁₆O₂)



Chlorprothixene (C₁₈H₁₈ClNS)



Sulfacetamide (C₈H₁₀N₂O₃S)



Ciclosporin (C₆₂H₁₁₁N₁₁O₁₂)

Table SI. The 60 potential drugs for papillary renal cell carcinoma treatment based on differently expressed genes.

Drug name	Dose	Cell line	Score	Instance ID
Pinacidil (C13H19N5)	16 μ M	HL60	-1	2406
Ciclosporin (C62H111N11O12)	3 μ M	HL60	-0.994	1331
Naftifine (C21H21N)	12 μ M	HL60	-0.966	2974
Vorinostat (C14H20N2O3)	10 μ M	HL60	-0.961	1161
Metacycline (C22H22N2O8)	8 μ M	HL60	-0.943	2901
Sulfacetamide (C8H10N2O3S)	16 μ M	HL60	-0.939	1859
Chlorprothixene (C18H18ClNS)	11 μ M	HL60	-0.938	1272
Amiodarone (C25H29I2NO3)	6 μ M	HL60	-0.933	2434
Noretynodrel (C20H26O2)	13 μ M	HL60	-0.914	1860
Valproic acid (C8H16O2)	200 μ M	HL60	-0.91	1155
Oxolinic acid (C13H11NO5)	15 μ M	HL60	-0.903	1419
Monocrotaline (C16H23NO6)	12 μ M	PC3	-0.881	7127
LY-294002 (C19H17NO3)	10 μ M	HL60	-0.869	1168
Aceclofenac (C16H13Cl2NO4)	11 μ M	PC3	-0.863	7269
Hyoscyamine (C17H23NO3)	14 μ M	HL60	-0.859	1424
Heliotrine (C16H27NO5)	13 μ M	HL60	-0.85	2180
Trichostatin A (C17H22N2O3)	1 μ M	HL60	-0.85	1175
Sulfachlorpyridazine (C10H8ClN4O2S)	14 μ M	HL60	-0.85	2191
Diflorasone (C22H28F2O5)	8 μ M	HL60	-0.838	2142
Yohimbine (C21H26N2O3)	10 μ M	MCF7	-0.833	6777
Sulfadiazine (C10H10N4O2S)	16 μ M	HL60	-0.833	1852
Pargyline (C11H13N)	20 μ M	PC3	-0.832	2102
Haloperidol (C21H23ClFNO2)	10 μ M	HL60	-0.829	6203
Methazolamide (C5H8N4O3S2)	17 μ M	MCF7	-0.823	3474
Pregnenolone (C21H32O2)	13 μ M	MCF7	-0.823	2856
Tanespimycin (C31H43N3O8)	1 μ M	HL60	-0.822	1166
Cinchonidine (C19H22N2O)	14 μ M	MCF7	-0.819	7190
Sirolimus (C51H79NO13)	100 nM	HL60	-0.819	2681
Dimenhydrinate (C24H28ClN5O3)	9 μ M	HL60	-0.816	2400
Aminophylline (C16H24N10O4)	10 μ M	HL60	-0.812	3036
Monorden (C18H17ClO6)	100 nM	HL60	-0.81	1160
Atovaquone (C22H19ClO3)	11 μ M	HL60	-0.81	2480
Bicuculline (C20H17NO6)	11 μ M	HL60	-0.805	2139
Etamivan (C12H17NO3)	18 μ M	HL60	-0.802	1730
Pentamidine (C19H24N4O2)	7 μ M	MCF7	-0.8	2834
Estradiol (C18H24O2)	100 nM	MCF7	-0.799	988
Sulindac (C20H17FO3S)	11 μ M	HL60	-0.797	1857
Dexpropranolol (C16H21NO2)	14 μ M	MCF7	-0.794	3553
Zoxazolamine (C7H5ClN2O)	24 μ M	HL60	-0.794	1270
Clomifene (C26H28ClNO)	7 μ M	HL60	-0.789	1269
Sulfaguanidine (C7H10N4O2S)	19 μ M	MCF7	-0.787	1495
AR-A014418 (C12H12N4O4S)	10 μ M	PC3	-0.787	7070
Monobenzene (C13H12O2)	20 μ M	HL60	-0.786	3054
Tridihexethyl (C21H36NO)	11 μ M	HL60	-0.784	2964
Nisoxetine (C17H21NO2)	13 μ M	HL60	-0.784	3117
Dexibuprofen (C13H18O2)	19 μ M	PC3	-0.784	6712
Doxylamine (C17H22N2O)	10 μ M	MCF7	-0.783	1473
α -yohimbine (C21H26N2O3)	10 μ M	MCF7	-0.779	2778
Wortmannin (C23H24O8)	10 nM	MCF7	-0.771	1081
Alimemazine (C18H22N2S)	5 μ M	MCF7	-0.768	3478
Ranitidine (C13H22N4O3S)	11 μ M	MCF7	-0.763	5425
Resveratrol (C14H12O3)	18 μ M	HL60	-0.763	1715
Amiloride (C6H8ClN7O)	13 μ M	MCF7	-0.761	1470

Table SI. Continued.

Drug name	Dose	Cell line	Score	Instance ID
Mefloquine (C ₁₇ H ₁₆ F ₆ N ₂ O)	10 μ M	HL60	-0.76	1364
Parthenolide (C ₁₅ H ₂₀ O ₃)	16 μ M	HL60	-0.76	1736
Bendroflumethiazide (C ₁₅ H ₁₄ F ₃ N ₃ O ₄ S ₂)	9 μ M	HL60	-0.756	2555
Pivampicillin (C ₂₂ H ₂₉ N ₃ O ₆ S)	9 μ M	MCF7	-0.753	3506
Pepstatin (C ₃₄ H ₆₃ N ₅ O ₉)	6 μ M	HL60	-0.752	1328
15- δ prostaglandin J ₂ (C ₂₀ H ₃₀ O ₄)	10 μ M	HL60	-0.751	1172
Fenspiride (C ₁₅ H ₂₀ N ₂ O ₂)	13 μ M	HL60	-0.75	1422

HL60, human promyelocytic leukemia cell; PC3, human prostate cancer cell; MCF7, human breast cancer cell.

Table SII. Pathways significantly affected by candidate drugs (FDR<0.1).

Drug names	Drug-related pathways	Corresponding subpathways
Vorinostat	hsa04115: p53 signaling pathway hsa04010: MAPK signaling pathway	hsa04115_1, hsa04115_2, hsa04115_3, hsa04115_4 hsa04010_33
Chlorprothixene LY-294002	hsa04115: p53 signaling pathway hsa04110: Cell cycle hsa04115: p53 signaling pathway	hsa04115_1, hsa04115_2, hsa04115_3, hsa04115_4, hsa04115_7 hsa04110_18 hsa04115_1
Yohimbine	hsa00980: Metabolism of xenobiotics by cytochrome P450 hsa00140: Steroid hormone biosynthesis hsa00380: Tryptophan metabolism	hsa00980_2 hsa:00140_1, hsa:00140_25, hsa:00140_27 hsa:00380_5
Tanespimycin Monorden	hsa04141: Protein processing in endoplasmic reticulum hsa04141: Protein processing in endoplasmic reticulum hsa:05145: Toxoplasmosis hsa:05145_18	hsa:04141_18 hsa:04141_23, hsa:04141_18
Trichostatin A	hsa:04630: Jak-STAT signaling pathway hsa04010: MAPK signaling pathway hsa04115: p53 signaling pathway	hsa:04630_3, hsa:04630_4 hsa:04010_15, hsa:04010_16 hsa:04115_1, hsa:04115_2
Mefloquine	hsa:00980: Metabolism of xenobiotics by cytochrome P450 hsa:04620: Toll-like receptor signaling pathway hsa:04141: Protein processing in endoplasmic hsa:05200: Pathways in cancer	hsa:00980_3 hsa:04620_9, hsa:04620_17, hsa:04620_18, hsa:04620_22 hsa:04141_1 hsa:05200_29
Fenspiride	hsa04010: MAPK signaling pathway hsa:00140: Steroid hormone biosynthesis	hsa:04010_3, hsa:04010_15, hsa:04010_30, hsa:04010_31, hsa:04010_34 hsa:00140_3, hsa:00140_4, hsa:00140_5, hsa:00140_6, hsa:00140_7, hsa:00140_8, hsa:00140_9, hsa:00140_10, hsa:00140_13, hsa:00140_16, hsa:00140_18, hsa:00140_19