

Table S1 Significant KEGG pathways with adjusted P values <0.05 in AKR1C1

| ID | Description | GeneRatio | BgRatio | pvalue | p.adjust | qvalue | geneID | Count |
|----------|---|-----------|----------|-------------|-------------|-------------|--|-------|
| hsa04080 | Neuroactive ligand-receptor interaction | 35/307 | 362/8158 | 2.16E-07 | 1.16E-05 | 1.01E-05 | 6750/5644/2925/9248/552/6869/2690/2641/2695/3375/4986/1815/6863/3952/796/3352/1511/2568/6866/1392/1081/2362 0/2151/4544/7432/5539/9568/1144/1136/3357/51052/7200/4295/2797/1134 | 35 |
| hsa05207 | Chemical carcinogenesis - receptor activation | 21/307 | 212/8158 | 4.52E-05 | 0.00120767 | 0.001052218 | 54578/4609/114/2247/107/7363/54577/2253/54657/2949/688/1950/1545/1543/54600/7471/1136/8822/54575/6258/1576 | 21 |
| hsa04020 | Calcium signaling pathway | 20/307 | 240/8158 | 0.000694927 | 0.01159659 | 0.010103869 | 444/810/2925/114/552/6869/2247/9965/107/5350/2253/4915/1950/2263/10345/57172/8822/3357/8911/55283 | 20 |
| hsa04976 | Bile secretion | 18/307 | 89/8158 | 3.75E-09 | 5.00E-07 | 4.36E-07 | 1244/54578/477/114/107/9429/7363/54577/54657/3781/10864/366/54600/6523/9376/343/54575/1576 | 18 |
| hsa05226 | Gastric cancer | 17/307 | 149/8158 | 4.14E-05 | 0.00120767 | 0.001052218 | 8313/7475/83998/4609/2247/9965/6932/51176/2253/1496/1950/2263/399694/7471/8822/6258/7476 | 17 |
| hsa04310 | Wnt signaling pathway | 17/307 | 170/8158 | 0.000214756 | 0.00477832 | 0.004163251 | 8313/7475/85407/84870/4609/6932/54894/147111/51176/59352/27121/7471/8549/1501/340419/7476/50964 | 17 |
| hsa00140 | Steroid hormone biosynthesis | 16/307 | 61/8158 | 4.80E-10 | 1.28E-07 | 1.12E-07 | 1645/1646/54578/1585/3283/7363/54577/6820/54657/3284/1545/1543/54600/1551/54575/1576 | 16 |
| hsa00980 | Metabolism of xenobiotics by cytochrome P450 | 15/307 | 78/8158 | 1.56E-07 | 1.16E-05 | 1.01E-05 | 1645/218/54578/7363/54577/222/54657/2949/1545/1543/1553/54600/1549/54575/1576 | 15 |
| hsa05204 | Chemical carcinogenesis - DNA adducts | 14/307 | 69/8158 | 2.03E-07 | 1.16E-05 | 1.01E-05 | 1646/54578/7363/54577/54657/2949/1545/1543/1553/54600/1551/1549/54575/1576 | 14 |
| hsa04974 | Protein digestion and absorption | 14/307 | 103/8158 | 2.84E-05 | 0.000947345 | 0.000825402 | 1357/1358/5644/440387/477/1504/10136/23436/4311/1360/1294/340024/1359/1280 | 14 |
| hsa04934 | Cushing syndrome | 14/307 | 155/8158 | 0.00205844 | 0.024981974 | 0.021766278 | 8313/7475/114/3283/6932/107/51176/3284/1392/7471/6770/3776/8911/7476 | 14 |
| hsa04972 | Pancreatic secretion | 13/307 | 102/8158 | 0.000107898 | 0.00261898 | 0.002281863 | 1357/1358/5644/440387/477/114/1504/10136/107/23436/1360/1359/1179 | 13 |
| hsa05224 | Breast cancer | 13/307 | 147/8158 | 0.003534695 | 0.036297937 | 0.031625642 | 8313/7475/4609/2247/9965/6932/51176/2253/1950/399694/7471/8822/7476 | 13 |
| hsa00830 | Retinol metabolism | 12/307 | 68/8158 | 7.14E-06 | 0.000317619 | 0.000276735 | 216/54578/7363/54577/54657/1543/54600/1551/195814/1549/54575/1576 | 12 |
| hsa00982 | Drug metabolism - cytochrome P450 | 12/307 | 72/8158 | 1.32E-05 | 0.000501826 | 0.00043723 | 218/54578/7363/54577/222/2326/54657/2949/54600/1549/54575/1576 | 12 |
| hsa03320 | PPAR signaling pathway | 10/307 | 75/8158 | 0.000464845 | 0.008865257 | 0.007724115 | 729359/2173/2170/23305/4312/2172/9370/23205/4973/6258 | 10 |
| hsa00983 | Drug metabolism - other enzymes | 10/307 | 80/8158 | 0.00078221 | 0.011602781 | 0.010109263 | 54578/1066/7363/54577/54657/2949/54600/1549/54575/1576 | 10 |
| hsa04911 | Insulin secretion | 10/307 | 86/8158 | 0.001379095 | 0.017534212 | 0.015277196 | 477/114/2645/2641/107/2695/3781/157855/6833/3651 | 10 |
| hsa04925 | Aldosterone synthesis and secretion | 10/307 | 98/8158 | 0.003670578 | 0.036297937 | 0.031625642 | 810/477/1585/114/3283/107/3284/57172/6770/8911 | 10 |
| hsa04913 | Ovarian steroidogenesis | 8/307 | 51/8158 | 0.000569401 | 0.010135333 | 0.008830706 | 114/3283/107/3284/1545/1081/1543/6770 | 8 |
| hsa05217 | Basal cell carcinoma | 8/307 | 63/8158 | 0.002343701 | 0.027207307 | 0.023705164 | 8313/7475/6932/51176/652/2736/7471/7476 | 8 |
| hsa04929 | GnRH secretion | 8/307 | 64/8158 | 0.002593024 | 0.028847388 | 0.025134132 | 6696/3760/3781/1081/610/9568/2797/8911 | 8 |
| hsa04927 | Cortisol synthesis and secretion | 8/307 | 65/8158 | 0.002862624 | 0.030572824 | 0.026637469 | 114/3283/107/3284/190/6770/3776/8911 | 8 |
| hsa00040 | Pentose and glucuronate interconversions | 7/307 | 35/8158 | 0.000270481 | 0.005555255 | 0.004840179 | 57016/54578/7363/54577/54657/54600/54575 | 7 |
| hsa00860 | Porphyryn metabolism | 7/307 | 43/8158 | 0.001001493 | 0.014073606 | 0.012262042 | 54578/7363/54577/54657/54600/212/54575 | 7 |
| hsa00053 | Ascorbate and aldarate metabolism | 6/307 | 30/8158 | 0.000747435 | 0.011602781 | 0.010109263 | 54578/7363/54577/54657/54600/54575 | 6 |
| hsa00340 | Histidine metabolism | 5/307 | 22/8158 | 0.001134205 | 0.015141641 | 0.013192599 | 218/84735/222/57571/131669 | 5 |

KEGG, Kyoto Encyclopedia of Genes and Genomes.

Table S2 Significant KEGG pathways with adjusted P values <0.05 in SERPINE1

| ID | Description | GeneRatio | BgRatio | pvalue | p.adjust | qvalue | geneID | Count |
|----------|---|-----------|----------|-------------|-------------|-------------|---|-------|
| hsa04080 | Neuroactive ligand-receptor interaction | 39/312 | 362/8158 | 3.10E-09 | 4.17E-07 | 3.45E-07 | 4922/5021/6750/1134/5644/2641/2797/9248/2357/3952/4986/6344/2555/6863/2568/8484/799/796/1136/2925/1815/6866/7432/2692/6869/4295/130576/5030/1392/3352/3375/4544/2695/51052/186/1511/7200/1144/51083 | 39 |
| hsa04151 | PI3K-Akt signaling pathway | 31/312 | 354/8158 | 1.24E-05 | 0.000476417 | 0.000393364 | 3371/9965/1293/2253/1278/1311/1277/2260/7057/3675/3918/5008/3694/1441/5156/3691/2056/3696/3381/7058/3909/3082/90993/3569/2248/26291/26281/8822/8074/8115/2786 | 31 |
| hsa05165 | Human papillomavirus infection | 25/312 | 331/8158 | 0.000855304 | 0.010458031 | 0.008634884 | 11317/3371/1293/1278/1311/1277/7057/3675/3918/5315/3694/3691/5743/3696/7475/3381/7058/3909/7472/90993/80326/8313/7482/7471/7476 | 25 |
| hsa04060 | Cytokine-cytokine receptor interaction | 24/312 | 295/8158 | 0.000374819 | 0.005979127 | 0.004936786 | 3589/3576/3976/6347/3952/5008/1441/3596/2056/10344/6374/3623/9547/3598/9966/2921/2658/53832/3569/6354/970/2919/6370/10563 | 24 |
| hsa04974 | Protein digestion and absorption | 22/312 | 103/8158 | 2.88E-11 | 7.74E-09 | 6.39E-09 | 1357/1301/5644/1293/1296/1281/1278/477/1358/1289/1277/1307/1300/3783/4311/1302/440387/1504/1308/10136/169044/7512 | 22 |
| hsa04310 | Wnt signaling pathway | 21/312 | 170/8158 | 1.84E-06 | 9.91E-05 | 8.18E-05 | 8061/6422/6423/7475/6424/4920/14711/7472/80326/85407/27121/8313/6425/4316/164284/7482/7471/340419/7476/11197/50964 | 21 |
| hsa05205 | Proteoglycans in cancer | 20/312 | 205/8158 | 0.000106304 | 0.002859573 | 0.002361064 | 5329/5328/1278/1277/2260/7057/3710/4313/7475/4318/7291/3082/7472/4060/1634/80326/7482/7471/117581/7476 | 20 |
| hsa04510 | Focal adhesion | 19/312 | 201/8158 | 0.000238566 | 0.004936486 | 0.004075909 | 3371/1293/1278/1311/1277/7057/3675/3918/3694/5156/3691/10398/3696/3381/7058/3909/3082/5923/4633 | 19 |
| hsa04657 | IL-17 signaling pathway | 18/312 | 94/8158 | 1.21E-08 | 1.08E-06 | 8.95E-07 | 6279/6280/3576/2354/4312/8061/2353/6347/3596/5743/6374/4318/2921/3569/4322/6354/2919/4586 | 18 |
| hsa04024 | cAMP signaling pathway | 18/312 | 221/8158 | 0.001976168 | 0.020910041 | 0.017264796 | 5021/6750/2641/477/2353/10398/810/338442/90993/8843/2867/7432/1080/1392/3352/2695/84152/114 | 18 |
| hsa04020 | Calcium signaling pathway | 18/312 | 240/8158 | 0.004793581 | 0.037925686 | 0.031314106 | 5021/9965/2253/2260/3710/5156/810/3082/8911/2925/2248/26291/26281/6869/8822/8074/114/57172 | 18 |
| hsa04915 | Estrogen signaling pathway | 17/312 | 138/8158 | 1.86E-05 | 0.000626775 | 0.00051751 | 54474/3859/3872/2353/3710/810/4313/4318/90993/3310/7031/25984/114/3880/3860/3868/3861 | 17 |
| hsa05226 | Gastric cancer | 17/312 | 149/8158 | 5.07E-05 | 0.00151577 | 0.001251526 | 9965/2253/7475/1496/3082/7472/80326/2248/26291/8313/26281/8822/7482/7471/83998/8074/7476 | 17 |
| hsa05207 | Chemical carcinogenesis - receptor activation | 17/312 | 212/8158 | 0.00307574 | 0.027579134 | 0.022771267 | 9314/2253/2353/1545/688/90993/1136/54577/2248/26281/8822/2940/7471/7367/114/2944/54575 | 17 |
| hsa04972 | Pancreatic secretion | 16/312 | 102/8158 | 1.37E-06 | 9.21E-05 | 7.60E-05 | 1357/5644/477/1358/3710/6344/5874/30814/1080/440387/1504/1811/1179/10136/114/5406 | 16 |
| hsa05224 | Breast cancer | 16/312 | 147/8158 | 0.000147882 | 0.003338944 | 0.002756867 | 9965/2253/2353/2260/7475/7472/80326/2248/26291/8313/26281/8822/7482/7471/8074/7476 | 16 |
| hsa04512 | ECM-receptor interaction | 14/312 | 88/8158 | 5.33E-06 | 0.000238804 | 0.000197174 | 3371/1293/1278/1311/1277/7057/3675/3918/3694/3691/3696/3381/7058/3909 | 14 |
| hsa04550 | Signaling pathways regulating pluripotency of stem cells | 13/312 | 143/8158 | 0.003195141 | 0.027725579 | 0.022892182 | 3976/9314/2260/7475/7472/10637/80326/8313/7482/7471/7044/3231/7476 | 13 |
| hsa04934 | Cushing syndrome | 13/312 | 155/8158 | 0.006333007 | 0.048673681 | 0.040188404 | 3710/7475/7472/90993/8911/80326/8313/1392/7482/6770/7471/7476/114 | 13 |
| hsa05410 | Hypertrophic cardiomyopathy | 12/312 | 90/8158 | 0.000148949 | 0.003338944 | 0.002756867 | 1674/3675/3694/3691/3696/3569/4634/786/70/55799/4633/59284 | 12 |
| hsa05150 | Staphylococcus aureus infection | 12/312 | 96/8158 | 0.000276714 | 0.004962403 | 0.004097308 | 54474/3383/1670/3859/3872/2357/25984/1668/3880/3860/3868/3861 | 12 |
| hsa05414 | Dilated cardiomyopathy | 12/312 | 96/8158 | 0.000276714 | 0.004962403 | 0.004097308 | 1674/3675/3694/3691/3696/4634/786/70/55799/4633/59284/114 | 12 |
| hsa04061 | Viral protein interaction with cytokine and cytokine receptor | 12/312 | 100/8158 | 0.000405908 | 0.006066067 | 0.00500857 | 3576/6347/10344/6374/9547/2921/53832/3569/6354/2919/6370/10563 | 12 |
| hsa05146 | Amoebiasis | 12/312 | 102/8158 | 0.000487615 | 0.006903601 | 0.005700097 | 3576/1281/1278/1277/3918/3909/2921/3569/6317/2919/1511/6318 | 12 |
| hsa04668 | TNF signaling pathway | 12/312 | 112/8158 | 0.001133823 | 0.013260799 | 0.010949045 | 3383/3976/9021/2353/6347/5743/6374/4318/2921/90993/3569/2919 | 12 |
| hsa04928 | Parathyroid hormone synthesis, secretion and action | 11/312 | 106/8158 | 0.002335206 | 0.02326557 | 0.019209686 | 5744/2353/2260/3710/860/90993/4322/8074/114/10568/50964 | 11 |
| hsa05218 | Melanoma | 10/312 | 72/8158 | 0.000377863 | 0.005979127 | 0.004936786 | 9965/2253/2260/5156/3082/2248/26291/26281/8822/8074 | 10 |
| hsa05412 | Arrhythmogenic right ventricular cardiomyopathy | 10/312 | 77/8158 | 0.000652995 | 0.00836455 | 0.006906359 | 1674/3675/3694/3691/3696/1496/88/786/55799/59284 | 10 |
| hsa04976 | Bile secretion | 10/312 | 89/8158 | 0.002021045 | 0.020910041 | 0.017264796 | 477/358/6523/6344/54577/1080/7367/114/54575/9376 | 10 |
| hsa05323 | Rheumatoid arthritis | 10/312 | 93/8158 | 0.002807684 | 0.026043688 | 0.021503495 | 3589/3383/3576/4312/2353/6347/6374/2921/3569/2919 | 10 |
| hsa04933 | AGE-RAGE signaling pathway in diabetic complications | 10/312 | 100/8158 | 0.004757981 | 0.037925686 | 0.031314106 | 5054/3383/3576/2152/1281/1278/1277/6347/4313/3569 | 10 |
| hsa05144 | Malaria | 8/312 | 50/8158 | 0.000552286 | 0.007428244 | 0.006133279 | 3383/3576/1311/6347/7057/7058/3082/3569 | 8 |
| hsa05217 | Basal cell carcinoma | 8/312 | 63/8158 | 0.00259144 | 0.024896336 | 0.020556161 | 7475/7472/80326/8313/7482/7471/2736/7476 | 8 |
| hsa04614 | Renin-angiotensin system | 5/312 | 23/8158 | 0.001510025 | 0.016924869 | 0.013974358 | 1215/4311/5972/186/1511 | 5 |
| hsa00910 | Nitrogen metabolism | 4/312 | 17/8158 | 0.003364015 | 0.028278749 | 0.023348919 | 759/1373/768/761 | 4 |

KEGG, Kyoto Encyclopedia of Genes and Genomes.

Table S3 The data of 80 significant abnormally expressed genes from RNA-seq

| Gene ID | High expression genes | Gene ID | Low expression genes |
|-----------------|-----------------------|-----------------|----------------------|
| ENSG00000215912 | <i>TTC34</i> | ENSG00000215274 | <i>GAGE10</i> |
| ENSG00000261915 | <i>AC026954.2</i> | ENSG00000187689 | <i>AMTN</i> |
| ENSG00000186529 | <i>CYP4F3</i> | ENSG00000138100 | <i>TRIM54</i> |
| ENSG00000141574 | <i>SECTM1</i> | ENSG00000175294 | <i>CATSPER1</i> |
| ENSG00000115041 | <i>KCNIP3</i> | ENSG00000139211 | <i>AMIGO2</i> |
| ENSG00000100867 | <i>DHRS2</i> | ENSG00000171564 | <i>FGB</i> |
| ENSG00000168481 | <i>LGI3</i> | ENSG00000134516 | <i>DOCK2</i> |
| ENSG00000089820 | <i>ARHGAP4</i> | ENSG00000176020 | <i>AMIGO3</i> |
| ENSG00000240065 | <i>PSMB9</i> | ENSG00000182578 | <i>CSF1R</i> |
| ENSG00000168874 | <i>ATOH8</i> | ENSG00000179546 | <i>HTR1D</i> |
| ENSG00000187134 | <i>AKR1C1</i> | ENSG00000171560 | <i>FGA</i> |
| ENSG00000271447 | <i>MMP28</i> | ENSG00000122861 | <i>PLAU</i> |
| ENSG00000128165 | <i>ADM2</i> | ENSG00000135919 | <i>SERPINE2</i> |
| ENSG00000171798 | <i>KNDC1</i> | ENSG00000243137 | <i>PSG4</i> |
| ENSG00000140961 | <i>OSGIN1</i> | ENSG00000039068 | <i>CDH1</i> |
| ENSG00000197063 | <i>MAFG</i> | ENSG00000183128 | <i>CALHM3</i> |
| ENSG00000119227 | <i>PIGZ</i> | ENSG00000101076 | <i>HNF4A</i> |
| ENSG00000197119 | <i>SLC25A29</i> | ENSG00000138207 | <i>RBP4</i> |
| ENSG00000184451 | <i>CCR10</i> | ENSG00000101680 | <i>LAMA1</i> |
| ENSG00000203618 | <i>GP1BB</i> | ENSG00000175874 | <i>CREG2</i> |
| ENSG00000163794 | <i>UCN</i> | ENSG00000105825 | <i>TFPI2</i> |
| ENSG00000188747 | <i>NOXA1</i> | ENSG00000198959 | <i>TGM2</i> |
| ENSG00000137070 | <i>IL11RA</i> | ENSG00000130477 | <i>UNC13A</i> |
| ENSG00000175040 | <i>CHST2</i> | ENSG00000128510 | <i>CPA4</i> |
| ENSG00000181264 | <i>TLCD5</i> | ENSG00000073910 | <i>FRY</i> |
| ENSG00000049769 | <i>PPP1R3F</i> | ENSG00000141968 | <i>VAV1</i> |
| ENSG00000138622 | <i>HCN4</i> | ENSG00000172985 | <i>SH3RF3</i> |
| ENSG00000151632 | <i>AKR1C2</i> | ENSG00000150551 | <i>LYPD1</i> |
| ENSG00000184371 | <i>CSF1</i> | ENSG00000226887 | <i>ERVMER34-1</i> |
| ENSG00000006047 | <i>YBX2</i> | ENSG00000100302 | <i>RASD2</i> |
| ENSG00000161921 | <i>CXCL16</i> | ENSG00000164687 | <i>FABP5</i> |
| ENSG00000162591 | <i>MEGF6</i> | ENSG00000122547 | <i>EEPD1</i> |
| ENSG00000165475 | <i>CRYL1</i> | ENSG00000120708 | <i>TGFB1</i> |
| ENSG00000126091 | <i>ST3GAL3</i> | ENSG00000143515 | <i>ATP8B2</i> |
| ENSG00000175318 | <i>GRAMD2A</i> | ENSG00000120162 | <i>MOB3B</i> |
| ENSG00000182685 | <i>BRICD5</i> | ENSG00000187720 | <i>THSD4</i> |
| ENSG00000144152 | <i>FBLN7</i> | ENSG00000215182 | <i>MUC5AC</i> |
| ENSG00000162545 | <i>CAMK2N1</i> | ENSG00000124225 | <i>PMEP1</i> |
| | | ENSG00000162745 | <i>OLFML2B</i> |
| | | ENSG00000198805 | <i>PNP</i> |
| | | ENSG00000127920 | <i>GNG11</i> |
| | | ENSG00000106366 | <i>SERPINE1</i> |

Table S4 MiRNA prediction data

| miDIP | starBase |
|-----------------|------------------|
| hsa-miR-197-3p | hsa-miR-634 |
| hsa-miR-135a-5p | hsa-miR-1226-3p |
| hsa-miR-145-5p | hsa-miR-4644 |
| hsa-miR-185-5p | hsa-miR-5701 |
| hsa-miR-365a-3p | hsa-miR-3190-5p |
| hsa-miR-135b-5p | hsa-miR-597-5p |
| hsa-miR-324-3p | hsa-miR-3137 |
| hsa-miR-338-3p | hsa-miR-6830-3p |
| hsa-miR-556-5p | hsa-miR-6165 |
| hsa-miR-628-5p | hsa-miR-5196-3p |
| hsa-miR-944 | hsa-miR-6717-5p |
| hsa-miR-1286 | hsa-miR-1251-3p |
| hsa-miR-1913 | hsa-miR-1537-3p |
| hsa-miR-4306 | hsa-miR-320a-5p |
| hsa-miR-3918 | hsa-miR-6790-3p |
| hsa-miR-4644 | hsa-miR-11399 |
| hsa-miR-4731-5p | hsa-miR-10399-3p |
| hsa-miR-506-5p | |