

Supplementary table 1. Univariate Cox hazard ratio regression model of clinical parameters and soluble carrier super family expression in TCGA ccRCC cohort

Parameters	Univariate		
	HR	95%CI	P.Value*
Age	1.029	1.015 to 1.042	0.000
Sex	0.932	0.679 to 1.281	0.666
Stage	1.944	1.695 to 2.229	0.000
Grade	2.399	1.941 to 2.965	0.000
Hb	1.083	0.923 to 1.270	0.328
WBC	1.243	1.088 to 1.420	0.001
PLT	0.990	0.871 to 1.26	0.879
Tumor size	1.174	0.946 to 1.459	0.146
Laterality	0.669	0.491 to 0.913	0.011
T	1.964	1.658 to 2.325	0.000
N	0.879	0.752 to 1.028	0.106
M	2.436	1.904 to 3.115	0.000
Necrosis	2.692	1.885 to 3.844	0.000
SLC1A1	0.704	0.640 to 0.774	0.000
SLC1A2	1.028	0.899 to 1.176	0.683
SLC1A3	0.911	0.803 to 1.034	0.148
SLC1A4	0.705	0.535 to 0.930	0.013
SLC1A5	1.831	1.465 to 2.287	0.000
SLC1A6	0.999	0.914 to 1.092	0.984
SLC1A7	1.002	0.923 to 1.087	0.966
SLC2A1	1.188	0.996 to 1.417	0.055
SLC2A10	1.063	0.920 to 1.227	0.409
SLC2A11	0.817	0.636 to 1.051	0.116
SLC2A12	1.180	0.988 to 1.410	0.068
SLC2A13	0.693	0.567 to 0.849	0.000
SLC2A14	1.108	0.970 to 1.266	0.132
SLC2A2	0.897	0.846 to 0.951	0.000
SLC2A3	1.215	1.058 to 1.396	0.006
SLC2A4	0.914	0.796 to 1.048	0.197
SLC2A4RG	1.215	0.973 to 1.517	0.085
SLC2A5	0.956	0.866 to 1.056	0.373
SLC2A6	1.669	1.420 to 1.963	0.000
SLC2A7	0.870	0.668 to 1.134	0.304
SLC2A8	1.013	0.767 to 1.338	0.927
SLC2A9	0.617	0.544 to 0.699	0.000
SLC3A1	0.788	0.741 to 0.839	0.000
SLC3A2	1.274	0.940 to 1.726	0.118
SLC4A1	0.951	0.889 to 1.018	0.148
SLC4A1AP	0.832	0.486 to 1.427	0.504
SLC4A2	1.239	0.873 to 1.759	0.229

SLC4A3	1.213	1.136 to 1.295	0.000
SLC4A4	0.731	0.657 to 0.812	0.000
SLC4A5	1.742	1.491 to 2.036	0.000
SLC4A7	1.145	0.966 to 1.357	0.119
SLC4A8	1.382	1.162 to 1.644	0.000
SLC4A9	0.998	0.887 to 1.124	0.978
SLC4A10	1.012	0.896 to 1.144	0.844
SLC4A11	1.102	0.978 to 1.241	0.110
SLCO4C1	0.813	0.756 to 0.874	0.000
SLCO5A1	1.308	1.148 to 1.491	0.000
SLC5A1	0.867	0.826 to 0.909	0.000
SLC5A2	0.953	0.890 to 1.022	0.178
SLC5A3	1.121	0.983 to 1.279	0.089
SLC5A4	0.901	0.812 to 0.999	0.049
SLC5A5	1.199	1.067 to 1.348	0.002
SLC5A6	2.094	1.702 to 2.577	0.000
SLC5A7	1.122	0.949 to 1.328	0.178
SLC5A8	0.902	0.866 to 0.939	0.000
SLC5A9	0.982	0.888 to 1.086	0.722
SLC5A10	0.854	0.809 to 0.901	0.000
SLC5A11	0.967	0.879 to 1.065	0.497
SLC5A12	0.887	0.846 to 0.930	0.000
SLCO6A1	1.421	1.100 to 1.837	0.007
SLC6A1	1.151	1.007 to 1.316	0.039
SLC6A2	0.984	0.815 to 1.187	0.864
SLC6A3	0.912	0.872 to 0.953	0.000
SLC6A4	1.003	0.831 to 1.211	0.975
SLC6A5	1.500	0.929 to 2.424	0.097
SLC6A6	1.276	1.056 to 1.543	0.012
SLC6A7	1.409	1.208 to 1.643	0.000
SLC6A8	1.017	0.887 to 1.166	0.812
SLC6A9	1.215	1.020 to 1.448	0.029
SLC6A10P	0.929	0.811 to 1.063	0.282
SLC6A11	1.153	0.921 to 1.442	0.215
SLC6A12	0.836	0.753 to 0.928	0.001
SLC6A13	0.865	0.822 to 0.910	0.000
SLC6A14	1.284	1.161 to 1.420	0.000
SLC6A15	1.102	1.026 to 1.184	0.008
SLC6A16	1.185	1.074 to 1.307	0.001
SLC6A17	1.159	1.043 to 1.288	0.006
SLC6A18	0.901	0.859 to 0.945	0.000
SLC6A19	0.869	0.833 to 0.907	0.000
SLC6A20	1.020	0.969 to 1.073	0.452
SLC7A1	1.140	0.982 to 1.324	0.084

SLC7A2	1.133	1.010 to 1.270	0.033
SLC7A3	1.090	0.887 to 1.340	0.414
SLC7A4	1.025	0.917 to 1.146	0.667
SLC7A5	1.367	1.241 to 1.505	0.000
SLC7A5P1	1.291	0.999 to 1.669	0.051
SLC7A5P2	1.136	1.007 to 1.281	0.038
SLC7A6	2.780	2.022 to 3.823	0.000
SLC7A6OS	0.838	0.574 to 1.223	0.359
SLC7A7	1.067	0.951 to 1.198	0.269
SLC7A8	0.970	0.860 to 1.095	0.625
SLC7A9	0.867	0.810 to 0.927	0.000
SLC7A10	1.017	0.906 to 1.142	0.772
SLC7A11	1.275	1.125 to 1.444	0.000
SLC7A13	0.911	0.811 to 1.024	0.117
SLC7A14	1.037	0.889 to 1.210	0.645
SLC8A1	0.802	0.686 to 0.937	0.005
SLC8A2	1.175	1.066 to 1.296	0.001
SLC8A3	0.930	0.818 to 1.058	0.273
SLC9A1	2.205	1.650 to 2.948	0.000
SLC9A10	0.969	0.823 to 1.141	0.706
SLC9A11	1.191	1.086 to 1.307	0.000
SLC9A2	1.026	0.954 to 1.103	0.490
SLC9A3	0.941	0.886 to 1.000	0.049
SLC9A3R1	0.820	0.673 to 1.001	0.051
SLC9A3R2	0.763	0.661 to 0.880	0.000
SLC9A4	0.952	0.854 to 1.061	0.373
SLC9A5	1.397	1.221 to 1.598	0.000
SLC9A6	0.786	0.534 to 1.159	0.225
SLC9A7	0.931	0.818 to 1.059	0.275
SLC9A8	1.215	0.844 to 1.748	0.295
SLC9A9	1.227	1.055 to 1.427	0.008
SLC10A1	1.074	0.913 to 1.263	0.388
SLC10A2	0.845	0.806 to 0.887	0.000
SLC10A3	1.720	1.195 to 2.477	0.004
SLC10A4	1.149	0.987 to 1.337	0.074
SLC10A5	0.791	0.693 to 0.902	0.000
SLC10A6	0.772	0.699 to 0.854	0.000
SLC10A7	0.682	0.491 to 0.949	0.023
SLC11A1	1.491	1.308 to 1.700	0.000
SLC11A2	1.549	1.137 to 2.112	0.006
SLC12A1	0.977	0.927 to 1.030	0.389
SLC12A2	0.728	0.609 to 0.871	0.001
SLC12A3	0.972	0.907 to 1.041	0.417
SLC12A4	0.550	0.408 to 0.741	0.000

SLC12A5	1.145	0.984 to 1.331	0.080
SLC12A6	0.634	0.505 to 0.796	0.000
SLC12A7	0.704	0.592 to 0.836	0.000
SLC12A8	1.281	1.175 to 1.397	0.000
SLC12A9	1.884	1.418 to 2.503	0.000
SLC13A1	0.889	0.851 to 0.929	0.000
SLC13A2	0.911	0.840 to 0.987	0.023
SLC13A3	1.066	1.008 to 1.127	0.026
SLC13A4	1.263	1.122 to 1.422	0.000
SLC13A5	1.122	0.999 to 1.260	0.051
SLC14A1	0.816	0.736 to 0.904	0.000
SLC14A2	1.103	0.981 to 1.241	0.102
SLC15A1	1.010	0.957 to 1.066	0.715
SLC15A2	1.006	0.899 to 1.127	0.913
SLC15A3	1.124	0.927 to 1.364	0.235
SLC15A4	1.202	0.927 to 1.560	0.165
SLC16A1	1.315	1.042 to 1.660	0.021
SLC16A10	1.021	0.915 to 1.139	0.715
SLC16A11	0.852	0.754 to 0.962	0.010
SLC16A12	0.789	0.746 to 0.835	0.000
SLC16A13	0.778	0.669 to 0.905	0.001
SLC16A14	0.824	0.656 to 1.035	0.096
SLC16A2	0.905	0.759 to 1.080	0.270
SLC16A3	1.174	0.944 to 1.460	0.149
SLC16A4	0.760	0.676 to 0.854	0.000
SLC16A5	1.058	0.915 to 1.223	0.447
SLC16A6	0.984	0.859 to 1.128	0.819
SLC16A7	0.933	0.821 to 1.059	0.284
SLC16A8	1.372	1.176 to 1.601	0.000
SLC16A9	0.811	0.755 to 0.870	0.000
SLC17A1	0.887	0.838 to 0.940	0.000
SLC17A2	0.866	0.808 to 0.928	0.000
SLC17A3	0.896	0.855 to 0.939	0.000
SLC17A4	0.888	0.841 to 0.937	0.000
SLC17A5	0.724	0.582 to 0.902	0.004
SLC17A6	2.276	1.163 to 4.453	0.016
SLC17A7	1.252	1.124 to 1.395	0.000
SLC17A8	0.955	0.847 to 1.077	0.456
SLC17A9	1.372	1.250 to 1.505	0.000
SLC18A1	0.990	0.823 to 1.191	0.917
SLC18A2	0.794	0.708 to 0.890	0.000
SLC18A3	1.120	1.071 to 1.172	0.000
SLC19A1	1.773	1.466 to 2.145	0.000
SLC19A2	1.054	0.892 to 1.246	0.538

SLC19A3	1.080	0.963 to 1.212	0.190
SLC20A1	2.118	1.699 to 2.641	0.000
SLC20A2	0.718	0.521 to 0.990	0.043
SLC22A1	1.243	1.130 to 1.368	0.000
SLC22A10	0.781	0.600 to 1.107	0.066
SLC22A11	0.869	0.824 to 0.917	0.000
SLC22A12	0.884	0.844 to 0.925	0.000
SLC22A13	0.879	0.821 to 0.941	0.000
SLC22A14	1.088	0.972 to 1.218	0.142
SLC22A15	1.369	1.191 to 1.574	0.000
SLC22A16	0.986	0.872 to 1.115	0.825
SLC22A17	1.122	0.961 to 1.311	0.145
SLC22A18	1.048	0.892 to 1.230	0.569
SLC22A18AS	1.030	0.898 to 1.182	0.672
SLC22A2	0.873	0.835 to 0.912	0.000
SLC22A20	1.312	1.164 to 1.478	0.000
SLC22A23	0.751	0.608 to 0.928	0.008
SLC22A24	0.791	0.728 to 0.860	0.000
SLC22A25	1.048	0.765 to 1.435	0.771
SLC22A3	0.947	0.860 to 1.043	0.271
SLC22A4	0.757	0.670 to 0.855	0.000
SLC22A5	0.736	0.623 to 0.870	0.000
SLC22A6	0.890	0.854 to 0.928	0.000
SLC22A7	0.878	0.824 to 0.936	0.000
SLC22A8	0.865	0.810 to 0.924	0.000
SLC22A9	0.860	0.755 to 0.980	0.023
SLC23A1	0.958	0.886 to 1.036	0.281
SLC23A2	0.968	0.732 to 1.280	0.819
SLC23A3	0.884	0.833 to 0.938	0.000
SLC24A1	0.759	0.557 to 1.036	0.082
SLC24A2	1.064	0.853 to 1.326	0.583
SLC24A3	0.998	0.911 to 1.093	0.966
SLC24A4	0.788	0.663 to 0.935	0.006
SLC24A5	1.199	1.060 to 1.357	0.004
SLC24A6	1.919	1.310 to 2.812	0.001
SLC25A1	1.288	1.029 to 1.613	0.027
SLC25A10	1.078	0.911 to 1.275	0.381
SLC25A11	0.807	0.578 to 1.126	0.207
SLC25A12	1.093	0.693 to 1.725	0.701
SLC25A13	0.542	0.399 to 0.736	0.000
SLC25A14	2.109	1.490 to 2.987	0.000
SLC25A15	1.277	1.000 to 1.630	0.050
SLC25A16	1.283	0.983 to 1.676	0.067
SLC25A17	0.995	0.586 to 1.690	0.985

SLC25A18	1.101	0.962 to 1.261	0.161
SLC25A19	2.069	1.648 to 2.597	0.000
SLC25A2	1.416	1.227 to 1.635	0.000
SLC25A20	0.649	0.451 to 0.935	0.020
SLC25A21	0.848	0.758 to 0.949	0.004
SLC25A22	2.041	1.634 to 2.549	0.000
SLC25A23	0.596	0.476 to 0.745	0.000
SLC25A24	0.618	0.513 to 0.745	0.000
SLC25A25	0.914	0.731 to 1.143	0.431
SLC25A26	1.076	0.778 to 1.487	0.658
SLC25A27	1.156	1.045 to 1.278	0.005
SLC25A28	1.573	1.148 to 2.155	0.005
SLC25A29	1.473	1.244 to 1.743	0.000
SLC25A3	1.206	0.827 to 1.759	0.330
SLC25A30	0.646	0.513 to 0.815	0.000
SLC25A31	1.179	0.804 to 1.729	0.399
SLC25A32	1.734	1.128 to 2.665	0.012
SLC25A33	1.018	0.826 to 1.254	0.868
SLC25A34	0.883	0.785 to 0.993	0.037
SLC25A35	1.932	1.573 to 2.373	0.000
SLC25A36	1.383	1.002 to 1.911	0.049
SLC25A37	1.727	1.452 to 2.054	0.000
SLC25A38	1.441	1.021 to 2.033	0.037
SLC25A39	1.840	1.448 to 2.339	0.000
SLC25A4	0.503	0.407 to 0.621	0.000
SLC25A40	0.787	0.696 to 0.891	0.000
SLC25A41	1.044	0.899 to 1.213	0.569
SLC25A42	0.642	0.538 to 0.767	0.000
SLC25A43	1.155	0.848 to 1.572	0.361
SLC25A44	0.635	0.470 to 0.859	0.003
SLC25A45	1.261	1.021 to 1.558	0.031
SLC25A46	0.694	0.576 to 0.836	0.000
SLC25A5	0.880	0.662 to 1.171	0.380
SLC25A6	1.152	0.892 to 1.488	0.277
SLC26A1	0.854	0.759 to 0.960	0.008
SLC26A10	1.191	1.094 to 1.298	0.000
SLC26A11	1.307	0.956 to 1.788	0.094
SLC26A2	0.927	0.699 to 1.230	0.600
SLC26A3	1.202	1.006 to 1.436	0.043
SLC26A4	0.834	0.699 to 0.995	0.044
SLC26A5	1.111	0.841 to 1.469	0.459
SLC26A6	1.777	1.503 to 2.100	0.000
SLC26A7	1.042	0.953 to 1.139	0.364
SLC26A8	1.469	1.214 to 1.778	0.000

SLC26A9	0.937	0.877 to 1.000	0.051
SLC27A1	1.023	0.748 to 1.400	0.886
SLC27A2	0.799	0.748 to 0.853	0.000
SLC27A3	1.347	1.051 to 1.728	0.019
SLC27A4	1.268	0.960 to 1.676	0.095
SLC27A5	1.125	0.959 to 1.319	0.148
SLC27A6	1.118	0.842 to 1.483	0.441
SLC28A1	0.776	0.721 to 0.835	0.000
SLC28A2	0.908	0.682 to 1.208	0.506
SLC28A3	1.144	0.981 to 1.334	0.087
SLC29A1	1.449	1.173 to 1.789	0.001
SLC29A2	1.006	0.915 to 1.106	0.904
SLC29A3	1.375	1.125 to 1.681	0.002
SLC29A4	1.010	0.895 to 1.140	0.876
SLC30A1	0.671	0.575 to 0.782	0.000
SLC30A10	1.019	0.939 to 1.106	0.654
SLC30A2	0.994	0.931 to 1.063	0.866
SLC30A3	1.114	1.002 to 1.239	0.046
SLC30A4	0.735	0.658 to 0.821	0.000
SLC30A5	0.676	0.490 to 0.932	0.017
SLC30A6	0.725	0.596 to 0.883	0.001
SLC30A7	0.945	0.638 to 1.398	0.775
SLC30A8	0.977	0.893 to 1.069	0.611
SLC30A9	0.473	0.364 to 0.614	0.000
SLC31A1	0.638	0.490 to 0.831	0.001
SLC31A2	0.797	0.649 to 0.977	0.029
SLC32A1	1.706	1.071 to 2.719	0.025
SLC33A1	0.524	0.400 to 0.687	0.000
SLC34A1	0.890	0.835 to 0.948	0.000
SLC34A2	1.044	1.000 to 1.090	0.048
SLC34A3	0.924	0.847 to 1.007	0.072
SLC35A1	1.280	0.880 to 1.862	0.197
SLC35A2	2.187	1.594 to 3.000	0.000
SLC35A3	0.728	0.643 to 0.824	0.000
SLC35A4	0.887	0.583 to 1.350	0.576
SLC35A5	0.522	0.400 to 0.681	0.000
SLC35B1	1.746	1.251 to 2.438	0.001
SLC35B2	2.019	1.378 to 2.959	0.000
SLC35B3	0.940	0.623 to 1.417	0.767
SLC35B4	0.595	0.429 to 0.826	0.002
SLC35C1	1.536	1.062 to 2.221	0.023
SLC35C2	2.517	1.888 to 3.354	0.000
SLC35D1	0.748	0.588 to 0.952	0.018
SLC35D2	0.678	0.480 to 0.956	0.027

SLC35D3	1.742	1.284 to 2.363	0.000
SLC35E1	0.713	0.469 to 1.084	0.113
SLC35E2	0.988	0.832 to 1.172	0.889
SLC35E3	0.794	0.596 to 1.056	0.113
SLC35E4	2.186	1.691 to 2.825	0.000
SLC35F1	0.824	0.730 to 0.930	0.002
SLC35F2	1.258	0.998 to 1.584	0.052
SLC35F3	1.144	1.057 to 1.237	0.001
SLC35F4	1.171	0.967 to 1.419	0.105
SLC35F5	0.689	0.546 to 0.869	0.002
SLC36A1	0.991	0.801 to 1.227	0.937
SLC36A2	1.046	0.983 to 1.113	0.154
SLC36A3	0.857	0.566 to 1.296	0.465
SLC36A4	0.867	0.657 to 1.144	0.313
SLC37A1	1.291	0.996 to 1.673	0.053
SLC37A2	0.900	0.778 to 1.040	0.153
SLC37A3	1.170	0.851 to 1.610	0.333
SLC37A4	0.805	0.652 to 0.994	0.044
SLC38A1	0.886	0.722 to 1.088	0.249
SLC38A10	1.972	1.410 to 2.756	0.000
SLC38A11	0.857	0.769 to 0.955	0.005
SLC38A2	0.994	0.733 to 1.349	0.971
SLC38A3	1.145	1.071 to 1.223	0.000
SLC38A4	0.987	0.928 to 1.050	0.682
SLC38A5	1.199	1.134 to 1.267	0.000
SLC38A6	1.430	1.103 to 1.852	0.007
SLC38A7	1.224	0.929 to 1.612	0.151
SLC38A8	0.996	0.766 to 1.294	0.975
SLC38A9	1.181	0.799 to 1.745	0.405
SLC39A1	1.375	0.923 to 2.048	0.118
SLC39A10	0.793	0.597 to 1.055	0.112
SLC39A11	1.679	1.320 to 2.137	0.000
SLC39A12	1.520	1.112 to 2.078	0.009
SLC39A13	2.254	1.671 to 3.040	0.000
SLC39A14	1.058	0.921 to 1.216	0.426
SLC39A2	1.083	0.916 to 1.279	0.351
SLC39A3	1.602	1.226 to 2.094	0.001
SLC39A4	1.025	0.908 to 1.159	0.687
SLC39A5	0.877	0.831 to 0.926	0.000
SLC39A6	1.082	0.850 to 1.376	0.523
SLC39A7	1.304	0.859 to 1.980	0.212
SLC39A8	0.651	0.540 to 0.785	0.000
SLC39A9	0.448	0.319 to 0.629	0.000
SLC40A1	0.654	0.570 to 0.750	0.000

SLC41A1	0.792	0.613 to 1.024	0.075
SLC41A2	0.815	0.649 to 1.024	0.079
SLC41A3	0.997	0.736 to 1.350	0.984
SLC43A1	1.404	1.188 to 1.659	0.000
SLC43A2	0.890	0.711 to 1.115	0.312
SLC43A3	1.457	1.214 to 1.748	0.000
SLC44A1	0.513	0.392 to 0.672	0.000
SLC44A2	0.598	0.465 to 0.769	0.000
SLC44A3	0.661	0.569 to 0.769	0.000
SLC44A4	0.804	0.739 to 0.875	0.000
SLC44A5	1.033	0.982 to 1.086	0.209
SLC45A1	0.854	0.724 to 1.007	0.060
SLC45A2	1.147	1.040 to 1.265	0.006
SLC45A3	1.087	0.926 to 1.275	0.309
SLC45A4	0.669	0.541 to 0.827	0.000
SLC46A1	0.627	0.489 to 0.804	0.000
SLC46A2	1.275	1.095 to 1.485	0.002
SLC46A3	1.171	0.950 to 1.443	0.139
SLC47A1	0.802	0.756 to 0.851	0.000
SLC47A2	0.933	0.860 to 1.012	0.096
SLC48A1	0.967	0.718 to 1.302	0.825
SLCO1A2	1.008	0.933 to 1.089	0.845
SLCO1B1	1.118	0.951 to 1.315	0.177
SLCO1B3	1.369	1.173 to 1.597	0.000
SLCO1C1	0.974	0.861 to 1.102	0.675
SLCO2A1	0.740	0.675 to 0.811	0.000
SLCO2B1	0.940	0.807 to 1.094	0.423
SLCO3A1	0.891	0.671 to 1.184	0.427
SLCO4A1	0.968	0.872 to 1.073	0.532

*Bold type indicates statistical significance; only significant ($p < 0.01$) parameters in univariate cox regression model and with measurable RNA expression enrolled in multivariate model
sex: female vs male

Supplementary Table 2 Gene annotations of upregulated SLC associated with poor outcome of ccRCC

Gene Name	UniGene	Gene Full name	Gene Ontology*
SLC7A9	Hs.408567	solute carrier family 7 (cationic amino acid transporter, y+ system), member 9	Cationic amino acid transporter/glycoprotein-associated
SLC9A5	Hs.439650	solute carrier family 9 (sodium/hydrogen exchanger), member 5	Na ⁺ /H ⁺ exchanger
SLC10A5	Hs.683849	solute carrier family 10 (sodium/bile acid cotransporter family), member 5	Sodium bile salt cotransporter
SLC12A7	Hs.172613	solute carrier family 12 (potassium/chloride transporters), member 7	Collecting duct acid secretion
SLC16A8	Hs.270285	solute carrier family 16, member 8 (monocarboxylic acid transporter 3)	Monocarboxylate transporter
SLC18A3	Hs.654374	solute carrier family 18 (vesicular acetylcholine), member 3	Vesicular amine transporter/H ⁺ antiporter-1 (12 spanner) (DHA1) family
SLC25A14	Hs.194686	solute carrier family 25 (mitochondrial carrier, brain), member 14	Mitochondrial carrier
SLC25A28	Hs.403790	solute carrier family 25, member 28	Mitochondrial carrier
SLC25A37	Hs.596025; Hs.658208; Hs.122514	solute carrier family 25, member 37	Mitochondrial carrier
SLC35E4	Hs.660384	solute carrier family 35, member E4	Nucleoside-sugar transporter
SLC35F3	Hs.158748	solute carrier family 35, member F3	Nucleoside-sugar transporter
SLC38A10	Hs.352240	solute carrier family 38, member 10	System A and System N sodium-coupled neutral amino acid transporter
SLC38A6	Hs.200738	solute carrier family 38, member 6	System A and System N sodium-coupled neutral amino acid transporter
SLCO2A1	Hs.518270	solute carrier organic anion transporter family, member 2A1	Organic anion transporter
SLCO4C1	Hs.127648	solute carrier organic anion transporter family, member 4C1	Organic anion transporter

* Gene ontology were annotated by KEGG brite

Supplementary Table 3 Gene annotations of upregulated SLC associated with favorable outcome of ccRCC

Gene Name	UniGene	Gene Full name	Gene Ontology*
SLC4A5	Hs.594099	solute carrier family 4, sodium bicarbonate cotransporter, member 5	Bicarbonate transporter;Exosomal proteins
SLC5A5	Hs.584804	solute carrier family 5 (sodium iodide symporter), member 5	Sodium glucose cotransporter
SLC6A7	Hs.241597	solute carrier family 6 (neurotransmitter transporter, L-proline), member 7	Sodium- and chloride-dependent neurotransmitter transporter
SLC10A2	Hs.194783	solute carrier family 10 (sodium/bile acid cotransporter family), member 2	Sodium bile salt cotransporter
SLC10A6	Hs.452996	solute carrier family 10 (sodium/bile acid cotransporter family), member 6	Sodium bile salt cotransporter
SLC12A4	Hs.10094	solute carrier family 12 (potassium/chloride transporters), member 4	Electroneutral cation-coupled Cl cotransporter
SLC25A19	Hs.514470	solute carrier family 25 (mitochondrial thiamine pyrophosphate carrier), member 19	Mitochondrial carrier
SLC40A1	Hs.643005	solute carrier family 40 (iron-regulated transporter), member 1	Basolateral iron transporter
SLC45A2	Hs.278962	solute carrier family 45, member 2	Putative sugar transporter
SLC47A1	Hs.232054	solute carrier family 47, member 1	Multidrug and Toxin Extrusion (MATE) family
SLCO5A1	Hs.152460,Hs.443609	solute carrier organic anion transporter family, member 5A1	Organic anion transporter

* Gene ontology were annotated by KEGG brite

Supplementary Table 4. Comparison of ccRCC SLC expression in sunitinib treated samples

Gene Name	Human cohort				Mice Xenograft				
	Untreated(N=47)	Sunitinib treated (N=75)		P*	Untreated(N=15)	Sunitinib treated(N=14)		Fold change	P*
	Mean±SD	Mean±SD	Fold change		Mean±SD	Mean±SD			
SLC4A5	4.865±0.564	4.870±0.482	1.003	0.945	93.111 ± 83.920	138.085±165.454	1.483	0.110	
SLC4A8	4.351±0.542	4.074±0.374	0.825	0.001	30.472 ± 18.835	26.857 ± 24.911	0.881	0.445	
SLC5A5	3.601±0.395	3.547±0.285	0.963	0.377	111.629± 64.373	114.407± 53.193	1.025	0.901	
SLC5A6	6.199±0.451	6.000±0.465	0.871	0.022	350.582±164.987	293.310±118.365	0.837	0.295	
SLC6A15	4.184±0.691	4.260±0.766	1.054	0.334	15.631 ± 14.710	13.517 ± 14.028	0.865	0.431	
SLC6A19	4.196±0.573	4.481±0.495	1.218	0.004	31.686± 25.957	31.686 ± 29.151	1.000	1.000	
SLC6A7	4.436±0.562	4.675±0.424	1.180	0.009	9.236 ± 3.219	7.724 ± 2.435	0.836	0.167	
SLC7A9	4.835±0.645	4.763±0.519	0.951	0.501	374.638±497.822	488.409±534.937	1.304	0.558	
SLC9A3R2	3.875±0.576	3.770±0.401	0.930	0.235	13.871 ± 10.266	14.442 ± 13.314	1.041	0.898	
SLC9A5	4.954±0.471	5.185±0.381	1.174	0.004	47.751 ± 37.596	56.846 ± 38.587	1.190	0.269	
SLC10A2	4.923±0.950	4.484±0.443	0.738	0.001	84.639 ± 42.102	50.521 ± 24.038	0.597	0.013	
SLC10A5	3.992±0.713	3.979±0.447	0.991	0.901	NA	NA			
SLC10A6	3.927±0.697	4.197±0.467	1.206	0.012	NA	NA			
SLC11A2	6.901±0.648	6.777±0.487	0.918	0.229	442.370±463.919	578.290±600.101	1.307	0.128	
SLC12A4	4.662±0.595	4.578±0.459	0.943	0.382	93.192 ± 79.382	89.461 ± 78.260	0.960	0.776	
SLC12A7	4.076±0.566	4.028±0.484	0.967	0.616	1130.925±393.716	1066.661±379.933	0.943	0.659	
SLC12A8	5.311±0.492	5.183±0.765	0.915	0.312	528.539±244.738	640.068±382.804	1.211	0.355	
SLC13A4	4.822±0.470	4.830±0.433	1.006	0.923	58.937 ± 34.774	55.482 ± 35.567	0.941	0.793	
SLC14A1	4.743±0.381	5.000±0.460	1.195	0.002	13.183 ± 12.122	14.186 ± 10.389	1.076	0.737	
SLC16A8	3.381±0.478	3.502±0.282	1.087	0.082	52.620 ± 36.301	31.979 ± 21.251	0.608	0.075	
SLC17A1	4.914±0.722	5.054±0.527	1.102	0.219	125.545± 99.525	47.326 ± 40.767	0.377	0.000	
SLC17A5	NA	NA			1136.002±384.012	1314.529±576.794	1.157	0.168	

SLC17A7	4.081±0.473	4.258±0.481	1.131	0.048	83.343 ± 51.558	83.739 ± 47.969	1.005	0.976
SLC18A3	4.175±0.556	4.165±0.536	0.993	0.923	35.927 ± 24.574	25.873 ± 11.899	0.720	0.177
SLC20A1	7.964±0.791	8.062±0.598	1.070	0.439	1232.182±1051.328	1623.184±1433.573	1.317	0.239
SLC22A2	5.180±1.355	5.285±1.266	1.075	0.538	164.711±166.961	17.845 ± 15.874	0.108	0.003
SLC22A20	<i>NA</i>	<i>NA</i>			<i>NA</i>	<i>NA</i>		
SLC24A6	4.893±0.568	4.617±0.505	0.826	0.006	215.337± 87.345	182.915± 87.842	0.849	0.164
SLC25A14	5.472±0.618	5.458±0.645	0.990	0.870	633.860±149.945	629.087±221.022	0.992	0.923
SLC25A19	6.366±0.327	6.281±0.309	0.943	0.156	280.044± 51.137	217.647± 67.401	0.777	0.009
SLC25A23	4.812±0.650	4.718±0.551	0.937	0.394	311.508±184.320	302.922±207.436	0.972	0.868
SLC25A27	4.652±0.647	4.549±0.505	0.931	0.327	18.976 ± 19.760	19.361 ± 19.799	1.020	0.907
SLC25A28	5.975±0.357	5.997±0.404	1.015	0.754	668.823±130.871	622.189±206.043	0.930	0.305
SLC25A29	4.296±0.568	4.251±0.440	0.969	0.485	153.006±143.706	140.217±130.360	0.916	0.617
SLC25A35	3.891±0.416	3.840±0.345	0.965	0.466	103.446± 51.567	105.724± 52.410	1.022	0.868
SLC25A37	5.802±0.882	5.811±1.015	1.006	0.957	357.676±278.655	450.800±397.458	1.260	0.021
SLC25A39	7.045±0.748	6.544±0.489	0.707	0.000	2005.105±454.516	1889.387±577.368	0.942	0.552
SLC25A46	5.169±0.432	4.974±0.429	0.874	0.016	2958.335±388.591	2969.176±834.714	1.004	0.949
SLC26A1	4.172±0.608	4.273±0.585	1.073	0.113	6.449 ± 4.196	5.202 ± 2.971	0.807	0.200
SLC26A8	4.555±0.789	4.617±0.760	1.044	0.383	22.849 ± 23.333	20.318 ± 20.657	0.889	0.760
SLC2A13	4.136±0.585	3.911±0.357	0.856	0.009	403.887±646.058	371.291±607.660	0.919	0.755
SLC30A1	5.866±0.492	5.906±0.590	1.028	0.589	1329.436±1708.261	1305.558±1789.612	0.982	0.949
SLC35A3	5.153±0.533	5.081±0.401	0.951	0.399	1524.829±562.436	1308.095±537.745	0.858	0.070
SLC35B2	6.427±0.421	6.093±0.474	0.793	0.000	2303.924±402.700	2275.986±656.965	0.988	0.890
SLC35B4	4.912±0.421	4.711±0.440	0.870	0.014	839.903±575.338	864.257±614.435	1.029	0.849
SLC35D3	3.653±0.534	3.649±0.319	0.997	0.961	19.989 ± 11.997	20.793 ± 15.559	1.040	0.877
SLC35E4	4.040±0.463	4.155±0.468	1.083	0.186	76.827 ± 75.488	76.657 ± 70.822	0.998	0.993
SLC35F3	4.139±0.735	4.117±0.540	0.985	0.788	93.322 ± 127.318	98.903 ± 127.346	1.060	0.868

SLC35F5	6.255±0.326	5.931±0.393	0.799	0.000	1445.362±2016.242	1244.108±1813.762	0.861	0.627
SLC38A10	4.223±0.539	4.241±0.459	1.013	0.727	193.725±332.877	189.588±342.137	0.979	0.931
SLC38A11	5.403±0.524	5.330±0.397	0.951	0.384	29.048 ± 15.500	21.450 ± 15.484	0.738	0.198
SLC38A6	5.219±0.554	5.123±0.482	0.936	0.318	1353.917±239.693	862.577±259.785	0.637	0.000
SLC39A3	4.618±0.440	4.674±0.566	1.040	0.149	233.184±264.160	198.410±212.839	0.851	0.503
SLC39A9	5.237±0.423	5.047±0.528	0.877	0.040	3964.148±4319.011	3690.185±4087.913	0.931	0.727
SLC40A1	7.177±1.032	7.216±1.197	1.027	0.793	226.294±224.122	98.075 ± 61.211	0.433	0.005
SLC44A4	4.871±0.432	5.022±0.391	1.110	0.005	74.635 ± 63.501	31.991 ± 29.918	0.429	0.002
SLC45A2	4.668±0.710	4.670±0.617	1.001	0.971	47.383 ± 38.847	54.468 ± 42.921	1.150	0.512
SLC47A1	<i>NA</i>	<i>NA</i>			457.591±799.829	381.792±501.428	0.834	0.764
SLC02A1	5.204±1.254	5.366±1.231	1.119	0.485	84.641 ± 34.394	69.864 ± 28.153	0.825	0.218
SLC04C1	5.899±0.847	5.516±0.668	0.767	0.006	172.335±422.757	68.089 ± 80.720	0.395	0.205
SLC05A1	4.327±0.454	4.525±0.443	1.147	0.019	15.132 ± 10.026	19.733 ± 16.113	1.304	0.361

*P t test, two side. p<0.05 were indicated as bold type