



Research article

A novel cuproptosis-related lncRNA prognostic signature for predicting treatment and immune environment of head and neck squamous cell carcinoma

Changxiang Huan^{1,*} and Jiaxin Gao²

¹ Zhongshan Clinical College, Dalian University, Dalian 116000, China

² Medical College, Guangxi University, Nanning 530000, China

* **Correspondence:** Email: huanchangxiang@s.dlu.edu.cn.

Supplementary

Table S1. Cuproptosis-related gene.

Gene	Reference
NLRP3	J. Dong, X. Wang, C. Xu, M. Gao, S. Wang, J. Zhang, et. al., Inhibiting NLRP3 inflammasome activation prevents copper-induced neuropathology in a murine model of Wilson's disease, <i>Cell Death Dis.</i> , 12 (2021), 87. https://doi.org/10.1038/s41419-021-03397-1
ATP7B, ATP7A, SLC31A1, FDX1, LIAS, LIPT1, DLD, DLAT, PDHA1, PDHB, MTF1, GLS, CDKN2A, DBT, GCSH, DLST	P. Tsvetkov, S. Coy, B. Petrova, M. Dreishpoon, A. Verma, M. Abdusamad, et. al., Copper induces cell death by targeting lipoylated TCA cycle proteins, <i>Science</i> , 375 (2022), 1254–1261. https://doi.org/10.1126/science.abf0529

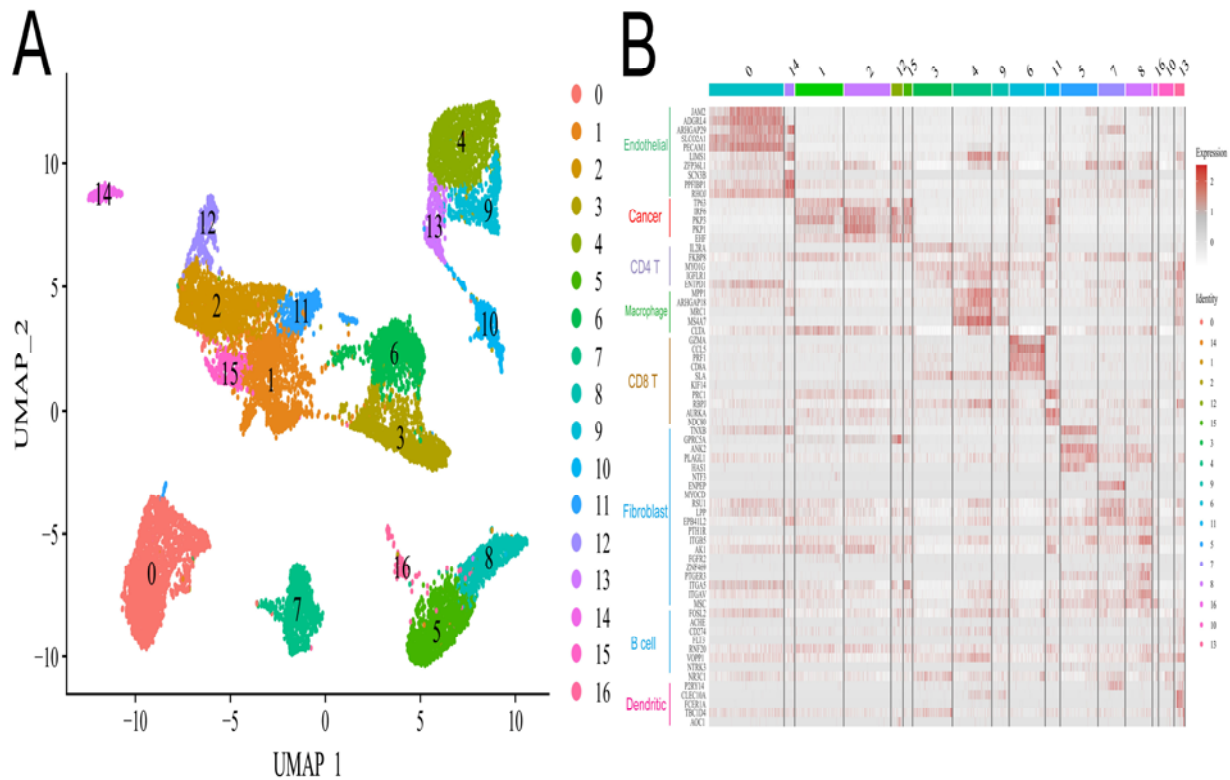


Figure S1. Processing single-cell RNA sequencing data (A) UMAP plots of 16 cell clusters. (B) Marker genes of seven cell subgroups.

Table S2. 486 cuproptosis-related lncRNAs.

Cuproptosis	lncRNA	cor	P-value	Regulation
GCSH	AC002310.1	0.450448823	1.49E-26	postive
DLD	AC002467.1	0.49446136	1.96E-32	postive
GCSH	AC002550.2	0.417226623	1.20E-22	postive
GCSH	AC004069.1	0.47916125	2.72E-30	postive
GCSH	AC004221.1	0.469097826	6.10E-29	postive
GCSH	AC004223.4	0.436584043	7.18E-25	postive
DBT	AC004492.1	0.423895648	2.13E-23	postive
DLD	AC004492.1	0.543890999	3.83E-40	postive
CDKN2A	AC004801.6	0.444128607	8.91E-26	postive
GCSH	AC004812.2	0.545763996	1.84E-40	postive
NLRP3	AC004817.3	0.561961562	2.70E-43	postive
DLD	AC004884.2	0.442185529	1.53E-25	postive
DLD	AC004893.2	0.403062058	4.13E-21	postive
GCSH	AC004908.2	0.428305055	6.67E-24	postive
DBT	AC004943.2	0.456975752	2.26E-27	postive
GCSH	AC004943.3	0.434454554	1.28E-24	postive
DLD	AC004967.2	0.43666757	7.01E-25	postive
GCSH	AC004967.2	0.427408327	8.46E-24	postive

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Cuproptosis	lncRNA	cor	P-value	Regulation
GCSH	AC005076.1	0.467375847	1.03E-28	postive
GCSH	AC005253.1	0.426941099	9.58E-24	postive
GCSH	AC005332.1	0.450423239	1.50E-26	postive
ATP7A	AC005670.3	0.493761387	2.47E-32	postive
DBT	AC005670.3	0.521542081	1.68E-36	postive
DLAT	AC005670.3	0.40169928	5.76E-21	postive
GCSH	AC005785.1	0.41378854	2.88E-22	postive
DBT	AC005837.1	0.430395284	3.82E-24	postive
GCSH	AC006001.2	0.406051178	1.99E-21	postive
ATP7A	AC006059.1	0.403632738	3.59E-21	postive
GCSH	AC006252.1	0.413659116	2.97E-22	postive
GCSH	AC006449.5	0.451874593	9.91E-27	postive
GCSH	AC007038.1	0.449327257	2.05E-26	postive
GCSH	AC007066.2	0.418873805	7.85E-23	postive
GCSH	AC007292.1	0.45525821	3.73E-27	postive
ATP7A	AC007365.1	0.434675758	1.21E-24	postive
DBT	AC007390.1	0.466093283	1.51E-28	postive
ATP7A	AC007406.4	0.430295963	3.92E-24	postive
GCSH	AC007497.1	0.438662032	4.06E-25	postive
DLD	AC007566.1	0.407033049	1.56E-21	postive
GCSH	AC007938.3	0.439742308	3.02E-25	postive
GCSH	AC008105.1	0.429240567	5.20E-24	postive
GCSH	AC008124.1	0.420164263	5.63E-23	postive
GCSH	AC008622.2	0.402061937	5.27E-21	postive
GCSH	AC008738.2	0.422029067	3.47E-23	postive
GCSH	AC008870.2	0.480839453	1.60E-30	postive
GCSH	AC008946.1	0.458574646	1.42E-27	postive
GCSH	AC009053.3	0.412270769	4.22E-22	postive
GCSH	AC009061.2	0.51427389	2.26E-35	postive
GCSH	AC009065.4	0.401186928	6.52E-21	postive
GCSH	AC009065.8	0.455107145	3.90E-27	postive
GCSH	AC009097.2	0.438687136	4.03E-25	postive
GCSH	AC009113.1	0.500666641	2.47E-33	postive
GCSH	AC009120.2	0.456971238	2.26E-27	postive
GCSH	AC009120.5	0.431185793	3.09E-24	postive
GCSH	AC009148.1	0.499992477	3.10E-33	postive
GCSH	AC009309.1	0.424815176	1.68E-23	postive
GCSH	AC009403.1	0.433294656	1.75E-24	postive
ATP7A	AC009486.2	0.415785336	1.73E-22	postive
GCSH	AC009506.1	0.456226015	2.81E-27	postive
GCSH	AC010148.1	0.407115482	1.53E-21	postive
DBT	AC010186.3	0.424366137	1.89E-23	postive

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Cuproptosis	lncRNA	cor	P-value	Regulation
GCSH	AC010336.7	0.528503364	1.32E-37	postive
GCSH	AC010422.2	0.472041267	2.48E-29	postive
GCSH	AC010463.3	0.419143065	7.33E-23	postive
CDKN2A	AC010503.4	0.410291285	6.93E-22	postive
GCSH	AC010531.6	0.4595272	1.07E-27	postive
GCSH	AC010536.1	0.483795863	6.27E-31	postive
GCSH	AC010542.5	0.422439987	3.12E-23	postive
GCSH	AC010618.2	0.402239065	5.05E-21	postive
GCSH	AC010618.3	0.448237389	2.80E-26	postive
GCSH	AC010761.1	0.45961808	1.04E-27	postive
ATP7A	AC010834.3	0.4749046	1.03E-29	postive
DBT	AC010834.3	0.579233107	1.70E-46	postive
GCSH	AC010894.1	0.413637762	2.99E-22	postive
GCSH	AC010976.1	0.405933923	2.04E-21	postive
GCSH	AC010997.4	0.4411446	2.05E-25	postive
GCSH	AC011370.1	0.445095991	6.80E-26	postive
GCSH	AC011405.1	0.424378997	1.88E-23	postive
GCSH	AC011444.1	0.41679565	1.34E-22	postive
GCSH	AC011450.1	0.410676176	6.29E-22	postive
GLS	AC011462.5	0.401240769	6.44E-21	postive
GCSH	AC011773.1	0.40529465	2.39E-21	postive
GCSH	AC011921.1	0.446420175	4.68E-26	postive
DBT	AC012073.1	0.408731952	1.02E-21	postive
GCSH	AC012184.3	0.429683656	4.62E-24	postive
GCSH	AC012306.2	0.403281301	3.92E-21	postive
DBT	AC012313.5	0.459925597	9.51E-28	postive
GCSH	AC012360.3	0.569557493	1.11E-44	postive
PDHB	AC012557.1	0.460303139	8.51E-28	postive
GCSH	AC012615.1	0.529704985	8.45E-38	postive
GCSH	AC012676.3	0.448511966	2.59E-26	postive
GCSH	AC012676.4	0.424859426	1.66E-23	postive
GLS	AC013451.2	0.40012686	8.43E-21	postive
GCSH	AC013731.1	0.465352952	1.89E-28	postive
PDHB	AC016044.1	0.439165978	3.54E-25	postive
GCSH	AC016065.1	0.402868817	4.33E-21	postive
DBT	AC016394.2	0.425195687	1.52E-23	postive
GCSH	AC016737.1	0.444578411	7.86E-26	postive
CDKN2A	AC016876.1	0.570806419	6.54E-45	postive
GCSH	AC017083.1	0.456239555	2.80E-27	postive
GCSH	AC018645.3	0.41474974	2.25E-22	postive
DBT	AC018809.2	0.414041109	2.70E-22	postive
CDKN2A	AC019171.1	0.500864004	2.31E-33	postive

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Cuproptosis	lncRNA	cor	P-value	Regulation
PDHB	AC019171.1	0.406267183	1.88E-21	postive
GCSH	AC020558.2	0.450353507	1.53E-26	postive
GCSH	AC020765.2	0.40898242	9.60E-22	postive
GCSH	AC021321.1	0.426564715	1.06E-23	postive
PDHB	AC022007.1	0.490485169	7.24E-32	postive
GCSH	AC022079.2	0.47851877	3.33E-30	postive
ATP7A	AC022137.3	0.416330634	1.51E-22	postive
GCSH	AC022144.1	0.440337136	2.56E-25	postive
GCSH	AC022506.2	0.433492317	1.66E-24	postive
GCSH	AC022966.2	0.407371288	1.43E-21	postive
GCSH	AC023283.1	0.43690715	6.57E-25	postive
PDHB	AC023593.1	0.434886905	1.14E-24	postive
PDHB	AC024060.2	0.411898244	4.63E-22	postive
ATP7A	AC024075.1	0.482796382	8.62E-31	postive
DBT	AC024075.1	0.560446491	5.04E-43	postive
GCSH	AC024560.4	0.408787796	1.01E-21	postive
ATP7A	AC025171.2	0.427674042	7.89E-24	postive
DBT	AC025171.2	0.463208652	3.59E-28	postive
GCSH	AC025265.1	0.422028198	3.47E-23	postive
GCSH	AC025682.1	0.412075797	4.43E-22	postive
GCSH	AC026254.2	0.402045052	5.29E-21	postive
GCSH	AC027031.2	0.40948015	8.48E-22	postive
GCSH	AC027307.2	0.428411292	6.49E-24	postive
GCSH	AC027682.1	0.479111169	2.76E-30	postive
GCSH	AC034236.2	0.444421677	8.21E-26	postive
CDKN2A	AC036176.1	0.466578736	1.31E-28	postive
GCSH	AC046143.2	0.4557134	3.27E-27	postive
GCSH	AC048344.4	0.441668961	1.77E-25	postive
GCSH	AC060780.1	0.47652432	6.21E-30	postive
GCSH	AC064836.3	0.475272902	9.16E-30	postive
GCSH	AC067750.1	0.407211541	1.49E-21	postive
MTF1	AC067852.2	-0.401374471	6.23E-21	negative
GCSH	AC068338.3	0.404000056	3.29E-21	postive
GCSH	AC068888.1	0.554321814	6.12E-42	postive
DBT	AC069185.1	0.407485533	1.39E-21	postive
PDHB	AC069222.1	0.409052465	9.44E-22	postive
PDHB	AC069224.1	0.470438702	4.06E-29	postive
DLD	AC069281.1	0.428383558	6.53E-24	postive
GCSH	AC069544.1	0.521042645	2.01E-36	postive
GCSH	AC072054.1	0.414576732	2.35E-22	postive
DBT	AC073073.2	0.413151867	3.38E-22	postive
DLD	AC073073.2	0.610062203	1.05E-52	postive

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Cuproptosis	lncRNA	cor	P-value	Regulation
GCSH	AC073195.1	0.519670128	3.30E-36	postive
GCSH	AC073352.1	0.401839493	5.57E-21	postive
GCSH	AC073389.3	0.416603111	1.41E-22	postive
GCSH	AC073842.2	0.418680753	8.25E-23	postive
GCSH	AC074117.1	0.51047646	8.55E-35	postive
GCSH	AC078802.1	0.449246048	2.10E-26	postive
GCSH	AC078846.1	0.515374939	1.53E-35	postive
GCSH	AC079414.3	0.472425549	2.21E-29	postive
GCSH	AC079807.1	0.441786659	1.71E-25	postive
GCSH	AC083843.2	0.444662733	7.67E-26	postive
GCSH	AC084125.2	0.557558861	1.65E-42	postive
GCSH	AC084864.1	0.461854293	5.38E-28	postive
GCSH	AC087239.1	0.406019891	2.00E-21	postive
GCSH	AC087289.2	0.463542261	3.25E-28	postive
DBT	AC090425.3	0.426568142	1.06E-23	postive
GCSH	AC090517.2	0.472661949	2.05E-29	postive
ATP7A	AC090587.1	0.526130348	3.16E-37	postive
MTF1	AC090587.1	0.408132139	1.19E-21	postive
GCSH	AC090772.3	0.415288997	1.97E-22	postive
CDKN2A	AC091057.1	0.411093354	5.67E-22	postive
DBT	AC091057.1	0.428719733	5.97E-24	postive
GCSH	AC091153.3	0.505090589	5.49E-34	postive
GCSH	AC092115.3	0.470370143	4.14E-29	postive
GCSH	AC092171.3	0.408113598	1.19E-21	postive
GCSH	AC092171.4	0.439944348	2.85E-25	postive
GCSH	AC092338.3	0.445639497	5.83E-26	postive
DLAT	AC092614.1	0.401019493	6.79E-21	postive
CDKN2A	AC092718.4	0.416907785	1.30E-22	postive
GCSH	AC092803.1	0.450986998	1.28E-26	postive
GCSH	AC092849.2	0.401246406	6.43E-21	postive
GCSH	AC093249.6	0.502206149	1.47E-33	postive
GCSH	AC093520.1	0.42567004	1.34E-23	postive
GCSH	AC093635.1	0.443342974	1.11E-25	postive
GCSH	AC096540.1	0.406962618	1.59E-21	postive
GCSH	AC096642.1	0.470783215	3.65E-29	postive
GCSH	AC096677.1	0.409827832	7.78E-22	postive
GCSH	AC097358.2	0.438833857	3.87E-25	postive
DBT	AC097376.3	0.411424861	5.22E-22	postive
GCSH	AC099522.2	0.537547024	4.41E-39	postive
GCSH	AC099778.1	0.415305773	1.96E-22	postive
GCSH	AC104472.4	0.405442008	2.31E-21	postive
CDKN2A	AC104794.3	0.453609482	6.01E-27	postive

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Cuproptosis	lncRNA	cor	P-value	Regulation
GCSH	AC106779.1	0.423221902	2.54E-23	postive
DBT	AC106820.5	0.434531221	1.25E-24	postive
GCSH	AC107375.1	0.495931498	1.21E-32	postive
ATP7A	AC108010.1	0.499094916	4.19E-33	postive
DBT	AC108010.1	0.427061839	9.27E-24	postive
ATP7A	AC108463.2	0.401632291	5.85E-21	postive
DLAT	AC108673.3	-0.407862221	1.27E-21	negative
MTF1	AC108673.3	-0.439533571	3.20E-25	negative
ATP7A	AC108693.2	0.443687276	1.01E-25	postive
GCSH	AC108860.2	0.476461373	6.33E-30	postive
GCSH	AC109322.1	0.449968173	1.71E-26	postive
GCSH	AC113139.1	0.403377732	3.83E-21	postive
GCSH	AC113410.4	0.452832894	7.52E-27	postive
DBT	AC114956.2	0.492993942	3.18E-32	postive
PDHB	AC116036.2	0.412341944	4.14E-22	postive
GCSH	AC116667.1	0.491930271	4.51E-32	postive
GCSH	AC116913.1	0.414119659	2.64E-22	postive
GCSH	AC120053.1	0.467536695	9.80E-29	postive
ATP7A	AC120114.1	0.465203914	1.98E-28	postive
DBT	AC120114.1	0.549525379	4.17E-41	postive
GCSH	AC124016.1	0.424590811	1.78E-23	postive
GCSH	AC124067.2	0.422433255	3.13E-23	postive
PDHB	AC124242.1	0.457238096	2.09E-27	postive
GCSH	AC125494.3	0.444955221	7.07E-26	postive
GCSH	AC127024.5	0.434159294	1.39E-24	postive
GCSH	AC130650.2	0.446707629	4.32E-26	postive
GCSH	AC131235.2	0.40643108	1.81E-21	postive
GCSH	AC131235.3	0.422855753	2.80E-23	postive
NLRP3	AC131254.1	0.405658943	2.19E-21	postive
GCSH	AC132872.1	0.404674251	2.79E-21	postive
GCSH	AC135050.6	0.448869934	2.34E-26	postive
GCSH	AC137932.3	0.424483116	1.83E-23	postive
GCSH	AC138696.2	0.451385108	1.14E-26	postive
GCSH	AC142472.1	0.496602863	9.64E-33	postive
GCSH	AC144652.1	0.439833131	2.94E-25	postive
GCSH	AC145285.6	0.443738606	9.94E-26	postive
GCSH	AC145423.1	0.419237032	7.15E-23	postive
GCSH	AC211476.2	0.412318203	4.17E-22	postive
CDKN2A	AC244034.2	0.405761382	2.13E-21	postive
DBT	AC244517.7	0.413474038	3.11E-22	postive
GCSH	AC253536.6	0.403046194	4.15E-21	postive
DBT	ACAP2-IT1	0.411086096	5.68E-22	postive

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Cuproptosis	lncRNA	cor	P-value	Regulation
GCSH	ADNP-AS1	0.426267103	1.14E-23	postive
CDKN2A	AF131215.6	0.453305894	6.56E-27	postive
CDKN2A	AL021807.1	0.434272758	1.35E-24	postive
GCSH	AL022311.1	0.503278137	1.02E-33	postive
GCSH	AL022328.2	0.41232168	4.16E-22	postive
GCSH	AL031186.1	0.434629384	1.22E-24	postive
DBT	AL031282.2	0.419992815	5.89E-23	postive
GCSH	AL031667.3	0.433663411	1.59E-24	postive
GCSH	AL033397.2	0.441237313	1.99E-25	postive
DBT	AL035587.1	0.420930195	4.62E-23	postive
GCSH	AL035587.2	0.47080337	3.63E-29	postive
NLRP3	AL049836.1	0.424430522	1.85E-23	postive
GCSH	AL050341.2	0.526096132	3.20E-37	postive
DBT	AL050343.2	0.417333199	1.17E-22	postive
GCSH	AL096701.4	0.537386905	4.69E-39	postive
CDKN2A	AL109936.2	0.569135646	1.33E-44	postive
GCSH	AL118516.1	0.515700051	1.36E-35	postive
GCSH	AL118558.3	0.400191002	8.30E-21	postive
GCSH	AL121658.1	0.445413384	6.22E-26	postive
GCSH	AL121672.2	0.46891723	6.45E-29	postive
GCSH	AL121832.2	0.457081704	2.19E-27	postive
GCSH	AL121906.2	0.505977397	4.05E-34	postive
GCSH	AL121917.1	0.4485243	2.58E-26	postive
GCSH	AL132655.2	0.407395537	1.42E-21	postive
GCSH	AL133215.2	0.41480008	2.22E-22	postive
DBT	AL133227.1	0.457986175	1.68E-27	postive
DLD	AL133243.2	0.419128761	7.36E-23	postive
GCSH	AL133243.2	0.482839666	8.50E-31	postive
GCSH	AL133367.1	0.457461752	1.96E-27	postive
NLRP3	AL133395.1	0.431672665	2.71E-24	postive
GCSH	AL133477.1	0.403552121	3.67E-21	postive
GCSH	AL135925.1	0.431103028	3.16E-24	postive
GCSH	AL135999.1	0.414342631	2.50E-22	postive
GCSH	AL136038.4	0.485007947	4.25E-31	postive
GCSH	AL136040.1	0.436986543	6.43E-25	postive
GCSH	AL136162.1	0.438442104	4.31E-25	postive
GCSH	AL136295.6	0.486975971	2.26E-31	postive
ATP7A	AL136419.3	0.433596232	1.62E-24	postive
GCSH	AL137077.2	0.431573045	2.79E-24	postive
GCSH	AL138921.1	0.405906774	2.06E-21	postive
GCSH	AL139287.1	0.407209038	1.49E-21	postive
GCSH	AL139353.2	0.425004563	1.60E-23	postive

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Cuproptosis	lncRNA	cor	P-value	Regulation
GCSH	AL157888.1	0.512928031	3.62E-35	postive
DLD	AL157932.1	0.405426227	2.32E-21	postive
GCSH	AL158214.2	0.414609567	2.34E-22	postive
PDHB	AL160314.2	0.428222125	6.82E-24	postive
GCSH	AL161729.4	0.471456255	2.97E-29	postive
GCSH	AL161756.1	0.412594364	3.89E-22	postive
DBT	AL161891.1	0.517319396	7.66E-36	postive
DBT	AL162595.1	0.465553159	1.78E-28	postive
GCSH	AL163051.1	0.553359057	9.02E-42	postive
CDKN2A	AL352984.1	0.444098987	8.99E-26	postive
GCSH	AL353708.3	0.430780848	3.45E-24	postive
GCSH	AL353719.1	0.420699812	4.90E-23	postive
ATP7A	AL353804.1	0.437907998	5.00E-25	postive
ATP7A	AL354993.2	0.47726458	4.93E-30	postive
DBT	AL354993.2	0.419238074	7.15E-23	postive
GCSH	AL355472.3	0.465182467	1.99E-28	postive
GCSH	AL355802.3	0.420876185	4.68E-23	postive
GCSH	AL355987.4	0.415257088	1.98E-22	postive
GCSH	AL355999.1	0.461104539	6.72E-28	postive
GCSH	AL357079.1	0.498943387	4.41E-33	postive
GCSH	AL357079.3	0.48761325	1.84E-31	postive
GCSH	AL358472.2	0.508511002	1.69E-34	postive
GCSH	AL358472.3	0.476419861	6.41E-30	postive
GCSH	AL359220.1	0.423875436	2.14E-23	postive
GCSH	AL359921.2	0.403201229	3.99E-21	postive
DBT	AL360270.1	0.413755145	2.90E-22	postive
GCSH	AL390037.1	0.406820683	1.64E-21	postive
GCSH	AL390728.6	0.429496017	4.86E-24	postive
GCSH	AL391427.1	0.411986107	4.53E-22	postive
NLRP3	AL391704.1	0.582344245	4.31E-47	postive
DBT	AL391840.3	0.421478726	4.01E-23	postive
CDKN2A	AL449423.1	0.497102968	8.16E-33	postive
GCSH	AL512343.2	0.400021996	8.64E-21	postive
GCSH	AL513550.1	0.413134654	3.39E-22	postive
GCSH	AL590062.1	0.483226303	7.51E-31	postive
GCSH	AL590617.2	0.469632615	5.19E-29	postive
GCSH	AL596202.1	0.474258722	1.25E-29	postive
GCSH	AL603839.3	0.423215941	2.55E-23	postive
GCSH	AL670729.3	0.426758423	1.00E-23	postive
GCSH	AL731569.1	0.473262428	1.71E-29	postive
GCSH	ALOX12-AS1	0.465209721	1.97E-28	postive
DLAT	AP000766.1	0.492345659	3.94E-32	postive

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Cuproptosis	lncRNA	cor	P-value	Regulation
FDX1	AP000866.1	0.401266533	6.40E-21	postive
GCSH	AP000892.3	0.401020936	6.79E-21	postive
GCSH	AP001160.1	0.422014685	3.48E-23	postive
GCSH	AP001412.1	0.401788784	5.63E-21	postive
GCSH	AP001462.1	0.458042526	1.66E-27	postive
DBT	AP001469.2	0.411933984	4.59E-22	postive
GCSH	AP001469.3	0.487295071	2.04E-31	postive
GCSH	AP002381.2	0.433096125	1.85E-24	postive
GCSH	AP002748.4	0.424367244	1.89E-23	postive
GCSH	AP003352.1	0.503664696	8.94E-34	postive
DLAT	AP003392.1	0.433236079	1.78E-24	postive
DBT	AP003721.3	0.415071786	2.08E-22	postive
GCSH	AP004609.3	0.411447572	5.19E-22	postive
GCSH	AP006621.3	0.491777878	4.74E-32	postive
GCSH	ASH1L-AS1	0.53180549	3.86E-38	postive
GCSH	ATXN2-AS	0.408980237	9.61E-22	postive
DBT	BDNF-AS	0.415940255	1.66E-22	postive
PDHB	BHLHE40-AS1	0.414100138	2.66E-22	postive
GCSH	BRWD1-AS2	0.410591916	6.43E-22	postive
GCSH	BX470102.1	0.436068778	8.26E-25	postive
GCSH	BX537318.1	0.429062246	5.45E-24	postive
GLS	C2orf27A	0.463796667	3.02E-28	postive
CDKN2A	C5orf66-AS1	0.412657676	3.83E-22	postive
GCSH	C8orf44	0.512343343	4.45E-35	postive
GCSH	CAPN10-DT	0.443710806	1.00E-25	postive
DBT	CASC2	0.440305815	2.58E-25	postive
GCSH	CD27-AS1	0.479400219	2.52E-30	postive
CDKN2A	CDKN2A-DT	0.732322455	8.17E-86	postive
CDKN2A	CDKN2B-AS1	0.413064268	3.45E-22	postive
GCSH	CEP83-DT	0.41995489	5.94E-23	postive
GLS	CHROMR	0.417614881	1.09E-22	postive
DBT	CKMT2-AS1	0.430587861	3.63E-24	postive
PDHB	CKMT2-AS1	0.457385676	2.01E-27	postive
ATP7A	COX10-AS1	0.467063088	1.13E-28	postive
DBT	COX10-AS1	0.435627854	9.31E-25	postive
GCSH	CRNDE	0.61139315	5.47E-53	postive
DBT	CTBP1-DT	0.45052237	1.46E-26	postive
GCSH	CTC-338M12.4	0.410173985	7.14E-22	postive
GCSH	DANCR	0.521776374	1.55E-36	postive
GCSH	DLGAP1-AS2	0.423431313	2.41E-23	postive
GCSH	DM1-AS	0.478427601	3.42E-30	postive
GCSH	DNAJC27-AS1	0.405563152	2.24E-21	postive

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Cuproptosis	lncRNA	cor	P-value	Regulation
DBT	DNAJC9-AS1	0.461185165	6.56E-28	postive
CDKN2A	DTX2P1-UPK3BP1- PMS2P11	0.401002798	6.82E-21	postive
GCSH	DYRK3-AS1	0.441296776	1.96E-25	postive
ATP7A	EBLN3P	0.444768579	7.45E-26	postive
DBT	EBLN3P	0.400237881	8.20E-21	postive
GCSH	EIF2AK3-DT	0.427138289	9.09E-24	postive
GCSH	ELOA-AS1	0.422589682	3.00E-23	postive
DLD	EMSLR	0.50694362	2.91E-34	postive
DBT	EP300-AS1	0.416974803	1.28E-22	postive
GCSH	EXTL3-AS1	0.406280174	1.88E-21	postive
DBT	FAM111A-DT	0.451503803	1.10E-26	postive
ATP7A	FAM160A1-DT	0.461238853	6.45E-28	postive
DBT	FAM160A1-DT	0.479984646	2.10E-30	postive
GCSH	FGF14-AS2	0.410023924	7.41E-22	postive
PDHB	FGF14-AS2	0.457564666	1.90E-27	postive
DBT	GRHL3-AS1	0.422591505	3.00E-23	postive
GCSH	GTSE1-DT	0.429403967	4.98E-24	postive
DBT	HCG18	0.485349086	3.81E-31	postive
GCSH	HDHD5-AS1	0.449222208	2.12E-26	postive
PDHB	HOXA-AS3	0.423335483	2.47E-23	postive
GCSH	ILF3-DT	0.538663865	2.88E-39	postive
GLS	INHBA-AS1	0.40475826	2.73E-21	postive
GCSH	KCNMB2-AS1	0.442383162	1.45E-25	postive
GCSH	KCTD21-AS1	0.443280263	1.13E-25	postive
PDHB	KIF9-AS1	0.475100968	9.66E-30	postive
GCSH	KMT2E-AS1	0.516606934	9.87E-36	postive
GCSH	LENG8-AS1	0.421827182	3.66E-23	postive
GCSH	LINC00115	0.430683905	3.54E-24	postive
GCSH	LINC00526	0.453164399	6.84E-27	postive
ATP7A	LINC00630	0.538048343	3.64E-39	postive
DBT	LINC00630	0.550068386	3.36E-41	postive
DLAT	LINC00630	0.468749001	6.78E-29	postive
DLD	LINC00630	0.415706453	1.77E-22	postive
DBT	LINC00649	0.430644647	3.57E-24	postive
NLRP3	LINC00707	0.500832477	2.34E-33	postive
GCSH	LINC00899	0.473419668	1.62E-29	postive
GCSH	LINC01004	0.425138744	1.54E-23	postive
CDKN2A	LINC01006	0.408350676	1.12E-21	postive
GCSH	LINC01012	0.414363447	2.49E-22	postive
GCSH	LINC01063	0.454709847	4.37E-27	postive
GCSH	LINC01089	0.402410535	4.84E-21	postive

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Cuproptosis	lncRNA	cor	P-value	Regulation
GCSH	LINC01311	0.524934561	4.90E-37	postive
CDKN2A	LINC01315	0.442324945	1.47E-25	postive
DLD	LINC01376	0.436363951	7.62E-25	postive
GCSH	LINC01410	0.433007123	1.89E-24	postive
GCSH	LINC01424	0.403723479	3.52E-21	postive
GCSH	LINC01431	0.419152851	7.31E-23	postive
ATP7A	LINC01521	0.556514477	2.52E-42	postive
DBT	LINC01521	0.444155353	8.85E-26	postive
DBT	LINC01560	0.40187094	5.52E-21	postive
PDHB	LINC01560	0.42328273	2.50E-23	postive
GCSH	LINC01564	0.414525598	2.39E-22	postive
GCSH	LINC01971	0.423464584	2.39E-23	postive
NLRP3	LINC02320	0.474644476	1.11E-29	postive
DLAT	LINC02700	0.400481541	7.73E-21	postive
GCSH	LINC02878	0.430992136	3.26E-24	postive
ATP7A	LYRM4-AS1	0.488482373	1.39E-31	postive
DBT	LYRM4-AS1	0.472950768	1.88E-29	postive
GCSH	MAFG-DT	0.472238191	2.34E-29	postive
PDHB	MALINC1	0.441848382	1.68E-25	postive
GCSH	MAPKAPK5-AS1	0.569015416	1.40E-44	postive
MTF1	MAPKAPK5-AS1	-0.40775317	1.30E-21	negative
GCSH	MCCC1-AS1	0.431818181	2.61E-24	postive
DBT	MCM3AP-AS1	0.487505141	1.90E-31	postive
DBT	MCPH1-AS1	0.44539511	6.25E-26	postive
GCSH	MELTF-AS1	0.491306008	5.54E-32	postive
GCSH	MHENCRCR	0.461864656	5.36E-28	postive
GCSH	MINCR	0.535422711	9.89E-39	postive
GCSH	MIR17HG	0.436570953	7.20E-25	postive
GCSH	MIR762HG	0.572857193	2.72E-45	postive
CDKN2A	MIR924HG	0.446426257	4.67E-26	postive
CDKN2A	MIR9-3HG	0.580942173	8.02E-47	postive
GCSH	MORF4L2-AS1	0.403508207	3.71E-21	postive
GLS	MSC-AS1	0.40185015	5.55E-21	postive
GCSH	MYLK-AS1	0.460568299	7.87E-28	postive
GCSH	NCK1-DT	0.412810161	3.68E-22	postive
GCSH	NFE2L1-DT	0.464138028	2.72E-28	postive
GCSH	NIFK-AS1	0.533883658	1.77E-38	postive
GCSH	NIPBL-DT	0.401025342	6.78E-21	postive
ATP7A	NORAD	0.441763062	1.72E-25	postive
DBT	NORAD	0.423255845	2.52E-23	postive
GCSH	NRSN2-AS1	0.403603948	3.62E-21	postive
GCSH	OBSCN-AS1	0.436115711	8.15E-25	postive

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Cuproptosis	lncRNA	cor	P-value	Regulation
DBT	OTUD6B-AS1	0.462785301	4.08E-28	positive
GCSH	OTUD6B-AS1	0.407469614	1.40E-21	positive
GCSH	PANK2-AS1	0.404232264	3.10E-21	positive
GCSH	PARD3-AS1	0.413480277	3.11E-22	positive
GCSH	PARTICL	0.478435665	3.41E-30	positive
DBT	PAXBPI-AS1	0.413138742	3.39E-22	positive
ATP7A	PAXIP1-AS2	0.439767228	3.00E-25	positive
DBT	PAXIP1-AS2	0.43274494	2.03E-24	positive
NLRP3	PDE2A-AS2	0.510402594	8.77E-35	positive
GCSH	PHC2-AS1	0.414652915	2.31E-22	positive
DBT	PINK1-AS	0.429445666	4.92E-24	positive
GCSH	PITPNA-AS1	0.41865543	8.31E-23	positive
GCSH	PKD1P6-NPIPP1	0.406666828	1.71E-21	positive
PDHB	POLH-AS1	0.409087901	9.36E-22	positive
PDHB	PPP3CB-AS1	0.400650076	7.43E-21	positive
GCSH	PRC1-AS1	0.404482378	2.92E-21	positive
GCSH	PRKCZ-AS1	0.404179628	3.14E-21	positive
GCSH	PVT1	0.443692287	1.01E-25	positive
GCSH	PXN-AS1	0.434328619	1.33E-24	positive
CDKN2A	RAB11B-AS1	0.424927083	1.63E-23	positive
GCSH	RAB30-DT	0.438538602	4.20E-25	positive
GCSH	RAD51-AS1	0.415020196	2.10E-22	positive
PDHB	RAMP2-AS1	0.459889267	9.62E-28	positive
GCSH	RCCD1-AS1	0.456227758	2.81E-27	positive
CDKN2A	RFPL1S	0.406456367	1.80E-21	positive
GCSH	RNF139-AS1	0.451469163	1.11E-26	positive
GCSH	RNF217-AS1	0.445192471	6.61E-26	positive
GCSH	RPARP-AS1	0.497434251	7.31E-33	positive
GCSH	RUSC1-AS1	0.402714793	4.50E-21	positive
GCSH	SATB2-AS1	0.406286849	1.87E-21	positive
GCSH	SCAMP1-AS1	0.42897526	5.58E-24	positive
GCSH	SCAT2	0.419146175	7.32E-23	positive
GCSH	SEC24B-AS1	0.448373947	2.69E-26	positive
GCSH	SLC12A9-AS1	0.45859601	1.41E-27	positive
ATP7A	SMG7-AS1	0.452225461	8.96E-27	positive
DBT	SMG7-AS1	0.433234139	1.78E-24	positive
GCSH	SNHG1	0.483165522	7.66E-31	positive
GCSH	SNHG10	0.606744872	5.28E-52	positive
GCSH	SNHG11	0.464145697	2.72E-28	positive
DLAT	SNHG16	0.434989883	1.11E-24	positive
GCSH	SNHG17	0.424401904	1.87E-23	positive
GCSH	SNHG20	0.500759744	2.39E-33	positive

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Cuproptosis	lncRNA	cor	P-value	Regulation
GCSH	SNHG21	0.413768711	2.89E-22	positive
MTF1	SNHG25	-0.421006568	4.53E-23	negative
GCSH	SNHG30	0.584490029	1.66E-47	positive
GCSH	SNHG4	0.448454542	2.63E-26	positive
DBT	SP2-AS1	0.495194642	1.54E-32	positive
GCSH	STAM-AS1	0.415310793	1.95E-22	positive
GCSH	STARD7-AS1	0.40781986	1.28E-21	positive
GCSH	STPG3-AS1	0.413560743	3.05E-22	positive
PDHB	STX18-AS1	0.412179244	4.32E-22	positive
DBT	SUCLG2-AS1	0.432944925	1.93E-24	positive
GCSH	SUGT1-DT	0.442909571	1.25E-25	positive
GCSH	SYNGAP1-AS1	0.554895307	4.86E-42	positive
PDHB	THUMPD3-AS1	0.535652071	9.07E-39	positive
GCSH	TIPARP-AS1	0.401851092	5.55E-21	positive
GCSH	TMED2-DT	0.45829967	1.54E-27	positive
GCSH	TMEM44-AS1	0.498958344	4.39E-33	positive
GCSH	TRAF3IP2-AS1	0.516925077	8.82E-36	positive
PDHB	TRAF3IP2-AS1	0.440492389	2.45E-25	positive
GCSH	TTC28-AS1	0.450527947	1.46E-26	positive
DBT	UBL7-AS1	0.483052076	7.94E-31	positive
PDHB	UBL7-AS1	0.402480488	4.76E-21	positive
GCSH	URB1-AS1	0.528569815	1.29E-37	positive
GCSH	VPS13B-DT	0.532844145	2.62E-38	positive
DBT	WARS2-AS1	0.476821748	5.66E-30	positive
DBT	WDFY3-AS2	0.429427214	4.95E-24	positive
GCSH	YTHDF3-AS1	0.427787276	7.65E-24	positive
ATP7A	Z68871.1	0.576193711	6.43E-46	positive
DBT	Z68871.1	0.523271116	8.99E-37	positive
DLAT	Z68871.1	0.445459488	6.14E-26	positive
GCSH	Z82243.1	0.450003129	1.69E-26	positive
GCSH	Z83745.1	0.476946566	5.44E-30	positive
GCSH	Z93930.3	0.433267219	1.77E-24	positive
DBT	Z94721.3	0.403425982	3.78E-21	positive
GCSH	Z95115.1	0.48465575	4.76E-31	positive
GCSH	ZEB1-AS1	0.429641149	4.67E-24	positive
MTF1	ZFAS1	-0.455321369	3.66E-27	negative
GCSH	ZFHX2-AS1	0.445668499	5.79E-26	positive
GCSH	ZKSCAN2-DT	0.461881427	5.33E-28	positive
GCSH	ZNF213-AS1	0.482993948	8.09E-31	positive
GCSH	ZNF252P-AS1	0.441306362	1.96E-25	positive
DBT	ZNF337-AS1	0.470550944	3.92E-29	positive
GCSH	ZNF687-AS1	0.469506777	5.39E-29	positive
GCSH	ZNRD2-AS1	0.4289392	5.64E-24	positive

Table S3. Clinical baseline.

Covariates	Type	Total	Test	Train	<i>P</i> -value
Age	≤ 65	326 (65.07%)	161 (64.4%)	165 (65.74%)	0.8257
	> 65	175 (34.93%)	89 (35.6%)	86 (34.26%)	
Gender	FEMALE	133 (26.55%)	71 (28.4%)	62 (24.7%)	0.403
	MALE	368 (73.45%)	179 (71.6%)	189 (75.3%)	
Grade	G1	61 (12.18%)	32 (12.8%)	29 (11.55%)	0.5013
	G2	299 (59.68%)	149 (59.6%)	150 (59.76%)	
	G3	119 (23.75%)	57 (22.8%)	62 (24.7%)	
	G4	2 (0.4%)	2 (0.8%)	0 (0%)	
	unknow	20 (3.99%)	10 (4%)	10 (3.98%)	
Stage	Stage I	25 (4.99%)	13 (5.2%)	12 (4.78%)	0.8591
	Stage II	69 (13.77%)	32 (12.8%)	37 (14.74%)	
	Stage III	79 (15.77%)	42 (16.8%)	37 (14.74%)	
	Stage IV	260 (51.9%)	128 (51.2%)	132 (52.59%)	
	unknow	68 (13.57%)	35 (14%)	33 (13.15%)	
T	T1	45 (8.98%)	25 (10%)	20 (7.97%)	0.2442
	T2	133 (26.55%)	72 (28.8%)	61 (24.3%)	
	T3	96 (19.16%)	40 (16%)	56 (22.31%)	
	T4	171 (34.13%)	84 (33.6%)	87 (34.66%)	
	unknow	56 (11.18%)	29 (11.6%)	27 (10.76%)	
M	M0	185 (36.93%)	92 (36.8%)	93 (37.05%)	1
	M1	1 (0.2%)	1 (0.4%)	0 (0%)	
	unknow	315 (62.87%)	157 (62.8%)	158 (62.95%)	
N	N0	170 (33.93%)	75 (30%)	95 (37.85%)	0.2806
	N1	66 (13.17%)	35 (14%)	31 (12.35%)	
	N2	165 (32.93%)	86 (34.4%)	79 (31.47%)	
	N3	7 (1.4%)	2 (0.8%)	5 (1.99%)	
	unknow	93 (18.56%)	52 (20.8%)	41 (16.33%)	



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