

**Table S5. The correlations of 490 autophagy-related genes with the ten-gene signature risk score were examined by the Pearson correlation coefficient.**

Gene symbol	r	P-value
ABL1	0.106453265	1.73E-02
ABL2	0.124895191	5.16E-03
ACER2	-0.069707132	1.20E-01
ADRA1A	-0.237936691	7.26E-08
ADRB2	-0.318292118	3.10E-13
AKT1	-0.076231594	8.86E-02
AMBRA1	-0.192161803	1.51E-05
APOL1	0.315773908	4.86E-13
ARNT	-0.11959368	7.43E-03
ARSA	-0.130331674	3.51E-03
ARSB	0.069451146	1.21E-01
ATF4	0.12576437	4.86E-03
ATF6	0.00589011	8.95E-01
ATG10	0.011693547	7.94E-01
ATG101	0.205034582	3.79E-06
ATG12	0.1042062	1.98E-02
ATG13	0.058685545	1.90E-01
ATG14	-0.145547665	1.10E-03
ATG16L1	0.240128274	5.46E-08
ATG16L2	-0.323421135	1.23E-13
ATG2A	-0.151052939	7.02E-04
ATG2B	-0.205912865	3.44E-06
ATG3	0.073200637	1.02E-01
ATG4A	-0.015997484	7.21E-01
ATG4B	-0.060802693	1.75E-01
ATG4C	-0.008959059	8.42E-01
ATG4D	-0.007103062	8.74E-01
ATG5	0.196947808	9.15E-06
ATG7	0.057332138	2.01E-01
ATG9A	0.237199013	7.99E-08
ATG9B	0.013916948	7.56E-01
ATIC	0.300557503	6.74E-12
ATM	-0.100910939	2.40E-02
ATP13A2	-0.018476539	6.80E-01
ATP6V0A1	-0.27592854	3.46E-10
ATP6V0A2	0.004598909	9.18E-01
ATP6V0B	0.003688191	9.34E-01
ATP6V0C	-0.042240199	3.46E-01
ATP6V0D1	-0.316681983	4.14E-13
ATP6V0D2	-0.171908544	1.12E-04
ATP6V0E1	-0.147855512	9.13E-04
ATP6V0E2	-0.12655626	4.59E-03
ATP6V1A	0.007729117	8.63E-01
ATP6V1B1	-0.082468417	6.54E-02
ATP6V1B2	-0.104664908	1.92E-02
ATP6V1C1	0.079282815	7.65E-02

ATP6V1C2	-0.066128762	1.40E-01
ATP6V1D	0.110448562	1.35E-02
ATP6V1E1	0.04532378	3.12E-01
ATP6V1E2	0.043171538	3.35E-01
ATP6V1G1	0.089258449	4.61E-02
ATP6V1G2	-0.086535337	5.31E-02
ATP6V1H	-0.070570848	1.15E-01
BAD	-0.218503525	8.08E-07
BAG1	-0.049001945	2.74E-01
BAG3	0.079966977	7.40E-02
BAK1	0.033810729	4.51E-01
BAX	0.018749434	6.76E-01
BCL2	-0.128003893	4.15E-03
BCL2L1	0.116721574	8.99E-03
BCL2L11	0.134173232	2.64E-03
BECN1	0.036289764	4.18E-01
BID	0.206680546	3.16E-06
BIRC5	0.454341659	7.76E-27
BIRC6	0.022578592	6.14E-01
BMF	-0.302279888	5.04E-12
BNIP1	-0.048734948	2.77E-01
BNIP3	0.094228153	3.52E-02
BNIP3L	-0.094171332	3.53E-02
BOK	-0.252166872	1.08E-08
C9orf72	-0.152089893	6.44E-04
CALCOCO2	-0.158339853	3.79E-04
CAMKK2	0.048013612	2.84E-01
CANX	0.018782853	6.75E-01
CAPN1	0.001839204	9.67E-01
CAPN10	-0.066419166	1.38E-01
CAPN2	-0.085470551	5.61E-02
CAPNS1	0.135565271	2.38E-03
CASP1	-0.140794838	1.60E-03
CASP3	0.249539069	1.55E-08
CASP4	0.050616356	2.59E-01
CASP8	0.015427215	7.31E-01
CCL2	0.075267579	9.27E-02
CCR2	-0.225247641	3.59E-07
CD46	-0.114459585	1.04E-02
CDC37	0.124228305	5.41E-03
CDK5	0.088184666	4.87E-02
CDK5R1	0.29553181	1.55E-11
CDKN1A	0.17695066	6.94E-05
CDKN1B	-0.076490903	8.75E-02
CDKN2A	0.161115406	2.98E-04
CFLAR	-0.240469957	5.22E-08
CHMP2B	0.184763518	3.23E-05
CHMP4A	-0.14926342	8.14E-04
CHMP4B	0.054439531	2.24E-01

CISD2	0.343216699	2.87E-15
CLEC16A	-0.188051193	2.31E-05
CLN3	-0.21400499	1.37E-06
CLU	-0.298676784	9.22E-12
CPTP	0.068082138	1.28E-01
CSNK2A2	0.105101292	1.87E-02
CTSA	0.04712829	2.93E-01
CTSB	0.119615771	7.41E-03
CTSD	-0.244138002	3.21E-08
CTTN	0.028898196	5.19E-01
CX3CL1	-0.2372153	7.97E-08
CXCR4	-0.084098221	6.02E-02
DAP	-0.065747324	1.42E-01
DAPK1	-0.297109972	1.20E-11
DAPK2	-0.471304811	5.16E-29
DAPK3	0.100038122	2.53E-02
DAPL1	-0.045368988	3.11E-01
DCN	-0.139917361	1.71E-03
DDIT3	0.029059357	5.17E-01
DHRSX	0.130154657	3.55E-03
DIRAS3	-0.11721445	8.70E-03
DLC1	-0.415321638	2.86E-22
DNAJB1	0.138006394	1.98E-03
DNAJB9	-0.074716944	9.51E-02
DNM1L	0.294354414	1.88E-11
DRAM1	-0.374841168	3.99E-18
DRAM2	-0.012574262	7.79E-01
EDEM1	-0.127500938	4.30E-03
EEF1A1	-0.160692321	3.09E-04
EEF1A2	0.056292605	2.09E-01
EEF2	-0.066316071	1.39E-01
EEF2K	-0.199400632	7.03E-06
EGFR	-0.010582851	8.13E-01
EIF2AK2	0.122689618	6.02E-03
EIF2AK3	0.054193842	2.26E-01
EIF2AK4	0.058651608	1.90E-01
EIF2S1	0.303603589	4.03E-12
EIF4EBP1	0.301614732	5.64E-12
EIF4G1	0.242826961	3.83E-08
EIF4G2	0.027594602	5.38E-01
EP300	-0.004663524	9.17E-01
EPM2A	-0.143190192	1.33E-03
ERBB2	-0.065315215	1.45E-01
ERCC4	-0.034272208	4.44E-01
ERN1	-0.209516208	2.29E-06
ERO1L	0.556476332	5.39E-42
EXOC1	0.149332166	8.09E-04
EXOC4	0.083432412	6.23E-02
EXOC7	-0.167215221	1.73E-04

EXOC8	-0.167583092	1.67E-04
FADD	0.21146904	1.83E-06
FAS	-0.088378695	4.83E-02
FBXL2	-0.081222853	6.96E-02
FBXO7	-0.024434523	5.86E-01
FBXW7	-0.029253985	5.14E-01
FEZ1	-0.092229136	3.93E-02
FEZ2	0.074066813	9.81E-02
FKBP1A	0.147900899	9.09E-04
FKBP1B	0.047249506	2.92E-01
FLCN	-0.215730636	1.12E-06
FOS	-0.164864946	2.13E-04
FOXK1	0.128133719	4.11E-03
FOXK2	0.162678316	2.59E-04
FOXO1	-0.013817101	7.58E-01
FOXO3	-0.053607388	2.31E-01
FTH1	0.072919907	1.03E-01
FTL	-0.002423666	9.57E-01
FYCO1	-0.28990069	3.88E-11
FZD5	-0.150283435	7.48E-04
GAA	-0.01887175	6.74E-01
GABARAP	-0.210193896	2.12E-06
GABARAPL1	0.136268731	2.26E-03
GABARAPL2	-0.208442958	2.59E-06
GAPDH	0.567120383	6.82E-44
GATA4	0.042339701	3.45E-01
GBA	0.016126789	7.19E-01
GFAP	0.052004824	2.46E-01
GNAI3	0.337784061	8.26E-15
GNB2L1	-0.143692877	1.27E-03
GOLGA2	0.056653561	2.06E-01
GOPC	0.122566366	6.07E-03
GPSM1	-0.09431417	3.50E-02
GRID1	-0.183089378	3.81E-05
GRID2	0.078908509	7.79E-02
GSK3A	0.265546986	1.62E-09
GSK3B	0.151705228	6.65E-04
HAX1	-0.016715308	7.09E-01
HDAC1	0.165485972	2.02E-04
HDAC6	-0.202033052	5.28E-06
HERC1	-0.215258335	1.18E-06
HGF	-0.112162323	1.21E-02
HGS	0.091421747	4.10E-02
HIF1A	0.294150891	1.95E-11
HK2	0.352683144	4.32E-16
HMGB1	0.113499308	1.11E-02
HMGB4	-0.023656197	5.98E-01
HMOX1	-0.005632817	9.00E-01
HSP90AA1	0.21413402	1.35E-06

HSP90AB1	0.072076289	1.07E-01
HSPA5	0.156147957	4.58E-04
HSPA8	0.113684909	1.10E-02
HSPB1	-0.043907094	3.27E-01
HSPB8	-0.291223246	3.13E-11
HTR2B	-0.010792369	8.10E-01
HTRA2	-0.013664891	7.61E-01
HTT	-0.031042611	4.89E-01
IFI16	0.115538588	9.72E-03
IFNG	0.129311206	3.77E-03
IFT20	-0.099115125	2.67E-02
IFT88	-0.202591986	4.97E-06
IKBKB	-0.322713098	1.39E-13
IKBKE	-0.081962407	6.71E-02
IKBKG	-0.042269081	3.46E-01
IL10	-0.094208533	3.52E-02
IL10RA	-0.164232452	2.26E-04
IL24	-0.170917433	1.23E-04
IL4	-0.184669546	3.26E-05
IRGM	-0.053258315	2.35E-01
ITGA3	0.050980408	2.55E-01
ITGA6	0.288168609	5.12E-11
ITGB1	0.40593391	2.94E-21
ITGB4	0.255526373	6.79E-09
ITPR1	-0.122803984	5.97E-03
KAT5	-0.255627073	6.70E-09
KAT8	-0.36674251	2.31E-17
KDM4A	-0.102180793	2.23E-02
KDR	-0.020045733	6.55E-01
KEAP1	-0.063936193	1.53E-01
KIAA0226	-0.020199951	6.52E-01
KIAA1324	-0.192427658	1.47E-05
KIF25	-0.14183916	1.47E-03
KIF5B	0.19740265	8.71E-06
KLHL22	-0.158076014	3.88E-04
KLHL24	-0.195777388	1.04E-05
KLHL3	-0.099982914	2.54E-02
LACRT	-0.021015078	6.39E-01
LAMP1	0.010660306	8.12E-01
LAMP2	0.017269221	7.00E-01
LAMP3	-0.345463676	1.84E-15
LAMTOR1	-0.068830974	1.24E-01
LAMTOR2	-0.041848558	3.50E-01
LAMTOR3	-0.034639308	4.40E-01
LAMTOR4	-0.08269359	6.47E-02
LAMTOR5	0.102292885	2.22E-02
LARP1	0.21443929	1.30E-06
LEP	0.142819764	1.36E-03
LEPR	-0.019335782	6.66E-01

LGALS8	-0.196650718	9.44E-06
LRRK2	-0.421157239	6.46E-23
LRSAM1	-0.218730511	7.87E-07
LZTS1	0.139154874	1.81E-03
MAP1LC3A	-0.240431895	5.24E-08
MAP1LC3B	-0.072208828	1.07E-01
MAP1LC3C	-0.247532119	2.04E-08
MAP2K7	-0.104373888	1.96E-02
MAP3K7	0.127903541	4.18E-03
MAPK1	-0.006365644	8.87E-01
MAPK15	-0.252756457	9.99E-09
MAPK3	-0.093898795	3.58E-02
MAPK8	-0.005235217	9.07E-01
MAPK8IP1	-0.146615653	1.01E-03
MAPK9	-0.140766626	1.60E-03
MAPT	-0.100298444	2.49E-02
MBTPS2	0.149756553	7.82E-04
MCL1	0.06506972	1.46E-01
MEFV	0.093271394	3.71E-02
MET	0.116030104	9.41E-03
MFN2	0.006921315	8.77E-01
MFSD8	-0.15469858	5.18E-04
MID2	-0.103626647	2.05E-02
MIR199A1	-0.125364859	5.00E-03
MIR199A2	0.007414228	8.69E-01
MLST8	0.014759962	7.42E-01
MT3	0.006572049	8.83E-01
MTCL1	0.229816276	2.04E-07
MTDH	0.2585827	4.42E-09
MTM1	-0.201786777	5.42E-06
MTMR14	-0.204589651	3.98E-06
MTMR3	-0.170082495	1.33E-04
MTMR8	-0.088724489	4.74E-02
MTMR9	0.06128275	1.71E-01
MTOR	0.110466194	1.35E-02
MUL1	0.103744714	2.03E-02
MYC	0.195529437	1.06E-05
NAF1	0.046344452	3.01E-01
NAMPT	0.380893717	1.04E-18
NBR1	-0.027026792	5.47E-01
NCKAP1	0.314900223	5.68E-13
NCOA4	-0.281995705	1.36E-10
NEDD4	0.240530915	5.18E-08
NFE2L2	-0.055433912	2.16E-01
NFKB1	-0.026255503	5.58E-01
NKX2-3	0.224541657	3.91E-07
NLRC4	-0.227380971	2.76E-07
NLRP6	-0.106638998	1.71E-02
NOD1	-0.45001625	2.66E-26

NPC1	0.022652665	6.13E-01
NPRL2	-0.339065187	6.45E-15
NPRL3	-0.062684762	1.62E-01
NRBP2	-0.274350581	4.39E-10
NRG1	0.01964613	6.61E-01
NRG2	-0.049861857	2.66E-01
NRG3	-0.055329823	2.17E-01
NUPR1	-0.225564538	3.45E-07
OPTN	0.146219117	1.04E-03
OSBPL7	-0.142488772	1.40E-03
P4HB	0.192912269	1.40E-05
PAFAH1B2	0.324850147	9.43E-14
PARK2	-0.01048658	8.15E-01
PARK7	0.012842843	7.75E-01
PARP1	0.10982407	1.40E-02
PEA15	-0.099808629	2.56E-02
PELP1	0.057804894	1.97E-01
PEX14	-0.052688678	2.40E-01
PEX3	-0.068476494	1.26E-01
PHF23	0.116004535	9.43E-03
PIK3C3	-0.001630287	9.71E-01
PIK3CA	0.145314452	1.12E-03
PIK3CB	-0.011361253	8.00E-01
PIK3R2	-0.015279375	7.33E-01
PIK3R4	0.108883706	1.49E-02
PIKFYVE	-0.021660365	6.29E-01
PIM2	-0.091678055	4.04E-02
PINK1	-0.129177044	3.81E-03
PIP4K2A	0.093967629	3.57E-02
PIP4K2B	-0.069293636	1.22E-01
PIP4K2C	0.155795108	4.72E-04
PLEKHF1	-0.125595014	4.92E-03
PLK2	0.166190781	1.89E-04
PLK3	-0.108986367	1.48E-02
POLDIP2	0.126804677	4.51E-03
PPP1R15A	-0.036590213	4.14E-01
PRKAA1	0.037573821	4.02E-01
PRKAA2	0.261006738	3.13E-09
PRKAB1	-0.325379423	8.55E-14
PRKAB2	0.078753151	7.85E-02
PRKACA	-0.139149406	1.82E-03
PRKAG1	-0.039593258	3.77E-01
PRKAG2	-0.155581576	4.80E-04
PRKAG3	-0.091901203	4.00E-02
PRKAR1A	-0.075424672	9.20E-02
PRKCD	-0.402429917	6.89E-21
PRKCQ	-0.131397782	3.24E-03
PRKD1	-0.095138816	3.34E-02
PSAP	-0.089463428	4.56E-02

PTEN	-0.118863655	7.80E-03
PTK2	-0.114301052	1.05E-02
PTK6	0.00970984	8.29E-01
PTPN22	-0.127946551	4.16E-03
PYCARD	-0.039888028	3.73E-01
QSOX1	-0.058338629	1.93E-01
RAB11A	0.185687215	2.94E-05
RAB12	-0.021551791	6.31E-01
RAB1A	0.248153138	1.87E-08
RAB1B	-0.014841957	7.41E-01
RAB24	-0.153792015	5.59E-04
RAB33B	-0.121139798	6.69E-03
RAB39B	-0.00581894	8.97E-01
RAB3GAP1	0.09095281	4.21E-02
RAB3GAP2	0.032845129	4.64E-01
RAB5A	0.055391465	2.16E-01
RAB7A	0.119775984	7.34E-03
RAB8A	0.177707818	6.45E-05
RAC1	0.302854471	4.57E-12
RAF1	-0.252879319	9.82E-09
RALB	0.2265007	3.08E-07
RASIP1	-0.000516649	9.91E-01
RB1	0.075806758	9.04E-02
RB1CC1	0.062492394	1.63E-01
RELA	0.093466969	3.67E-02
RGS19	0.025377527	5.71E-01
RHEB	0.039077107	3.83E-01
RIPK2	0.312170749	9.19E-13
RNF152	0.06779135	1.30E-01
RNF41	-0.088855476	4.71E-02
RNF5	-0.242382486	4.06E-08
ROCK1	0.0214822	6.32E-01
RPS6KB1	0.171727618	1.14E-04
RPTOR	0.146127319	1.05E-03
RRAGA	-0.078110835	8.10E-02
RRAGB	-0.268891629	9.94E-10
RRAGC	0.047928013	2.85E-01
RRAGD	-0.079678284	7.51E-02
RUFY4	-0.112289135	1.20E-02
SAR1A	0.012537317	7.80E-01
SCFD1	0.075038739	9.37E-02
SCOC	0.160830059	3.05E-04
SEC22B	0.051379665	2.51E-01
SERPINA1	-0.085256942	5.68E-02
SESN1	-0.383857713	5.33E-19
SESN2	-0.182527057	4.03E-05
SESN3	-0.2944502	1.85E-11
SH3BP4	0.120396943	7.03E-03
SH3GLB1	0.153771678	5.60E-04



SIRT1	-0.095150083	3.34E-02
SIRT2	-0.200880982	5.99E-06
SLC38A9	-0.02881704	5.20E-01
SMCR8	-0.023087877	6.07E-01
SMURF1	0.066611945	1.37E-01
SNCA	0.008430489	8.51E-01
SNRNP70	-0.092675508	3.83E-02
SNX32	-0.111243862	1.28E-02
SNX5	-0.139828878	1.72E-03
SNX6	0.169595919	1.39E-04
SOGA1	0.114011003	1.07E-02
SOGA3	-0.273143619	5.27E-10
SPHK1	0.423860727	3.21E-23
SPNS1	-0.120245695	7.11E-03
SPTLC1	0.174419982	8.84E-05
SPTLC2	-0.129339973	3.77E-03
SQSTM1	-0.02094	6.40E-01
SREBF1	-0.024754974	5.81E-01
SREBF2	0.025582318	5.68E-01
ST13	0.042151023	3.47E-01
STAT3	-0.01651606	7.13E-01
STK11	-0.173565084	9.58E-05
STUB1	-0.090970911	4.20E-02
STX12	-0.217610256	8.98E-07
SUPT5H	0.171585863	1.15E-04
SVIP	-0.104374928	1.96E-02
SYNPO2	-0.141696628	1.49E-03
TAB2	0.102221087	2.23E-02
TAB3	-0.163042409	2.51E-04
TBC1D12	-0.210506515	2.05E-06
TBC1D14	0.019581919	6.62E-01
TBC1D25	-0.255910893	6.44E-09
TBK1	0.167497744	1.68E-04
TEX264	-0.231965764	1.56E-07
TFEB	-0.394310851	4.77E-20
TICAM1	0.204802897	3.89E-06
TLK2	0.086407994	5.35E-02
TM9SF1	0.090208035	4.38E-02
TMEM150A	-0.413416613	4.61E-22
TMEM150B	-0.061042936	1.73E-01
TMEM150C	-0.097561603	2.92E-02
TMEM59	-0.18103575	4.67E-05
TMEM74	0.104288501	1.97E-02
TNFSF10	-0.116354526	9.21E-03
TOMM7	-0.11638556	9.19E-03
TP53	-0.096926068	3.02E-02
TP53INP1	-0.362035076	6.25E-17
TP53INP2	0.177059639	6.87E-05
TP63	0.035960811	4.22E-01

TP73	-0.100260993	2.50E-02
TPCN1	-0.129932355	3.61E-03
TPCN2	-0.004038893	9.28E-01
TRAPPC8	-0.054003471	2.28E-01
TREM2	-0.230013091	1.99E-07
TRIB3	0.249007008	1.67E-08
TRIM13	-0.163593704	2.39E-04
TRIM21	-0.053266185	2.34E-01
TRIM22	-0.352366658	4.61E-16
TRIM65	-0.056304806	2.09E-01
TRIM8	-0.134467382	2.59E-03
TSC1	-0.185579849	2.97E-05
TSC2	-0.206450672	3.24E-06
TSPO	-0.002612644	9.54E-01
TUSC1	-0.088839816	4.71E-02
UBQLN1	0.215096749	1.21E-06
UBQLN2	0.09517828	3.34E-02
UBQLN4	-0.015788698	7.25E-01
UCHL1	0.27945069	2.01E-10
ULK1	0.100871676	2.41E-02
ULK2	-0.234229649	1.17E-07
ULK3	-0.207226219	2.97E-06
USP10	0.118915408	7.77E-03
USP13	-0.230565648	1.86E-07
USP30	-0.212520972	1.63E-06
USP33	0.070180798	1.17E-01
UVRAG	-0.13732389	2.09E-03
VAMP3	-0.032265824	4.72E-01
VAMP7	0.100892374	2.41E-02
VDAC1	0.420338773	7.97E-23
VEGFA	0.065536391	1.43E-01
VMP1	0.017388037	6.98E-01
VPS13C	-0.190897812	1.73E-05
VPS13D	-0.202082381	5.25E-06
VPS26A	0.106147095	1.76E-02
VPS26B	-0.180337824	5.00E-05
VPS35	-0.000776513	9.86E-01
WAC	0.030025107	5.03E-01
WDFY3	-0.108408989	1.53E-02
WDR24	-0.151732446	6.64E-04
WDR41	0.004928637	9.12E-01
WDR45	-0.222941497	4.75E-07
WDR45B	0.238886442	6.42E-08
WDR6	-0.279725154	1.93E-10
WDR81	-0.147539353	9.36E-04
WIP1	0.147483015	9.41E-04
WIP2	0.076128565	8.90E-02
XPA	-0.254363134	7.99E-09
ZC3H12A	0.131212993	3.29E-03

ZFYVE1	-0.00416674	9.26E-01
ZKSCAN3	-0.14379312	1.26E-03
ZMPSTE24	0.124252027	5.40E-03

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