

Supplemental Data

Wolfe P, Murphy J, McGinley J, Zhu Z, Jiang W, Gottschall EB, Thompson HJ. (2004) Using nuclear morphometry to discriminate the tumorigenic potential of cells: a comparison of statistical methods. *Cancer Epidemiol Biomarkers Prev.* Jun;13(6):976-88

The SAS System

The CORR Procedure

39 Variables:	CELLAREA PGDNA DENSITY AVGOPTIC SUMOPTIC SHAPE PERIMETE ELONGATI MINDIAME MAXDIAME CELLFERE CELLF001 RUNLENGT CFGRUNLE VALLEY PEAK SLOPE STANDARD ANGULARS CORRELAT COEFFICI DIFFE002 ENTROPY INFOMEAS INFOM001 MAXIMALC PRODUCTM SUMVARIA SUMAVERA CONTRAST DIAGO001 DIAGONAL DIFFEREN DIFFE001 INVERSED PEAKTRAN TRIANGUL SECONDDI SUMENTRO
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Simple Statistics							
Variable	N	Mean	Std Dev	Median	Minimum	Maximum	Label
CELLAREA	200	48.63510	17.75096	43.68000	23.58000	118.82000	CELL AREA
PGDNA	200	7.49920	0.42602	7.68000	6.48000	7.95000	Pg DNA
DENSITY	200	0.16835	0.05812	0.17000	0.05000	0.33000	DENSITY
AVGOPTIC	200	0.36100	0.12222	0.36000	0.12000	0.69000	AVG OPTICAL DENSITY
SUMOPTIC	200	86.59840	4.91722	88.66500	74.89000	91.85000	SUM OPTICAL DENSITY
SHAPE	200	13.49570	0.64215	13.43500	12.08000	15.81000	SHAPE
PERIMETE	200	26.24805	5.03926	25.16500	17.54000	44.62000	PERIMETER
ELONGATI	200	1.27320	0.15386	1.24000	1.08000	1.92000	ELONGATION
MINDIAME	200	7.20700	1.32092	6.90000	4.63000	11.84000	MIN DIAMETER
MAXDIAME	200	9.14585	1.60716	8.82500	6.48000	14.53000	MAX DIAMETER
CELLFERE	200	8.77275	1.50623	8.58000	5.72000	13.74000	CELL FERET Y
CELLF001	200	8.41160	1.61689	8.16000	5.78000	13.94000	CELL FERET X
RUNLENGT	200	233.80000	62.02747	224.50000	127.00000	406.00000	RUN LENGTH
CFGRUNLE	200	49.61500	36.71371	43.00000	2.00000	239.00000	CFG RUN LENGTH
VALLEY	200	41.84000	30.71206	36.00000	2.00000	196.00000	VALLEY
PEAK	200	117.85000	39.49515	110.00000	62.00000	323.00000	PEAK
SLOPE	200	583.85500	155.94853	558.50000	295.00000	1050	SLOPE
STANDARD	200	0.17980	0.09849	0.17000	0.02000	0.47000	STANDARD DEV
ANGULARS	200	0.03475	0.00520	0.03000	0.03000	0.05000	ANGULAR SECOND MOMENT
CORRELAT	200	0.84325	0.03130	0.85000	0.71000	0.91000	CORRELATION
COEFFICI	200	0.41795	0.09007	0.43000	0.19000	0.64000	COEFF of VARIATION
DIFFE002	200	0.49055	0.03404	0.49000	0.40000	0.60000	DIFFERENCE ENTROPY
ENTROPY	200	1.48180	0.03299	1.48000	1.37000	1.59000	ENTROPY
INFOMEAS	200	-0.32810	0.03665	-0.33000	-0.44000	-0.20000	INFO MEASURE A
INFOM001	200	0.66310	0.02811	0.67000	0.55000	0.74000	INFO MEASURE B

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The CORR Procedure

Simple Statistics							
Variable	N	Mean	Std Dev	Median	Minimum	Maximum	Label
MAXIMALC	200	0.75935	0.05728	0.76000	0.55000	0.91000	MAX CORR COEFF
PRODUCTM	200	339.33575	339.39905	236.54000	5.65000	1767	PRODUCT MOMENT
SUMVARIA	200	1478	1481	1006	24.27000	7613	SUM VARIANCE
SUMAVERA	200	78.40750	26.89587	77.85000	25.54000	153.88000	SUM AVERAGE
CONTRAST	200	121.09790	127.36086	82.19000	1.66000	731.93000	CONTRAST
DIAGO001	200	9.84380	2.73512	9.83500	3.52000	17.71000	DIAGONAL MOMENT
DIAGONAL	200	0.0006920	0.0002923	0.0006677	0.0001345	0.00182	DIAGONAL VARIANCE
DIFFEREN	200	6.96345	3.89080	6.52500	0.85000	20.34000	DIFFERENCE MOMENT
DIFFE001	200	57.48045	58.60760	40.48500	0.92000	318.02000	DIFFERENCE VARIANCE
INVERSED	200	0.39320	0.05868	0.38000	0.26000	0.64000	INVERSE DIFFERENCE MOMENT
PEAKTRAN	200	0.09390	0.01650	0.09000	0.05000	0.14000	PEAK TRANSITIONAL PROB
TRIANGUL	200	0.23885	0.08958	0.22000	0.06000	0.61000	TRIANGULAR SYMMETRY
SECONDDI	200	3.47935	1.94562	3.26000	0.42000	10.17000	SECOND DIAG MOMENT
SUMENTRO	200	1.15340	0.00613	1.15000	1.14000	1.16000	SUM ENTROPY

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The CORR Procedure

Spearman Correlation Coefficients, N = 200 Prob > r under H0: Rho=0							
	CELLAREA	PGDNA	DENSITY	AVGOPTIC	SUMOPTIC	SHAPE	PERIMETE
CELLAREA CELL AREA	1.00000	-0.30744 <.0001	-0.98765 <.0001	-0.98828 <.0001	-0.30674 <.0001	0.61427 <.0001	0.99247 <.0001
PGDNA Pg DNA	-0.30744 <.0001	1.00000	0.42033 <.0001	0.42043 <.0001	0.99987 <.0001	-0.26562 0.0001	-0.31419 <.0001
DENSITY DENSITY	-0.98765 <.0001	0.42033 <.0001	1.00000	0.99821 <.0001	0.41959 <.0001	-0.61260 <.0001	-0.98098 <.0001
AVGOPTIC AVG OPTICAL DENSITY	-0.98828 <.0001	0.42043 <.0001	0.99821 <.0001	1.00000	0.41964 <.0001	-0.61567 <.0001	-0.98209 <.0001
SUMOPTIC SUM OPTICAL DENSITY	-0.30674 <.0001	0.99987 <.0001	0.41959 <.0001	0.41964 <.0001	1.00000	-0.26574 0.0001	-0.31343 <.0001
SHAPE SHAPE	0.61427 <.0001	-0.26562 0.0001	-0.61260 <.0001	-0.61567 <.0001	-0.26574 0.0001	1.00000	0.68175 <.0001
PERIMETE PERIMETER	0.99247 <.0001	-0.31419 <.0001	-0.98098 <.0001	-0.98209 <.0001	-0.31343 <.0001	0.68175 <.0001	1.00000
ELONGATI ELONGATION	-0.03653 0.6076	0.00522 0.9416	0.04220 0.5530	0.04261 0.5491	0.00328 0.9633	0.42670 <.0001	0.02113 0.7665
MINDIAME MIN DIAMETER	0.90818 <.0001	-0.27039 0.0001	-0.90052 <.0001	-0.90048 <.0001	-0.26951 0.0001	0.39068 <.0001	0.87416 <.0001
MAXDIAME MAX DIAMETER	0.95072 <.0001	-0.30817 <.0001	-0.93982 <.0001	-0.94008 <.0001	-0.30794 <.0001	0.71991 <.0001	0.96244 <.0001
CELLFERE CELL FERET Y	0.88696 <.0001	-0.25200 0.0003	-0.87374 <.0001	-0.87575 <.0001	-0.25140 0.0003	0.57464 <.0001	0.88079 <.0001
CELLF001 CELL FERET X	0.92338 <.0001	-0.33019 <.0001	-0.91655 <.0001	-0.91678 <.0001	-0.32952 <.0001	0.63708 <.0001	0.92973 <.0001
RUNLENGT RUN LENGTH	0.98890 <.0001	-0.26911 0.0001	-0.97328 <.0001	-0.97308 <.0001	-0.26817 0.0001	0.61422 <.0001	0.98390 <.0001
CFGRUNLE CFG RUN LENGTH	0.77778 <.0001	-0.18143 0.0101	-0.75809 <.0001	-0.75609 <.0001	-0.18041 0.0106	0.43452 <.0001	0.76377 <.0001
VALLEY VALLEY	0.78665 <.0001	-0.17486 0.0133	-0.76607 <.0001	-0.76409 <.0001	-0.17376 0.0139	0.44274 <.0001	0.77431 <.0001
PEAK PEAK	0.82616 <.0001	-0.12984 0.0669	-0.79764 <.0001	-0.79561 <.0001	-0.12887 0.0690	0.50836 <.0001	0.82039 <.0001
SLOPE SLOPE	0.96526 <.0001	-0.26671 0.0001	-0.95019 <.0001	-0.95073 <.0001	-0.26601 0.0001	0.60482 <.0001	0.96038 <.0001
STANDARD STANDARD DEV	-0.97941 <.0001	0.40739 <.0001	0.98583 <.0001	0.98724 <.0001	0.40664 <.0001	-0.58308 <.0001	-0.96868 <.0001

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The SAS System

The CORR Procedure

Spearman Correlation Coefficients, N = 200 Prob > r under H0: Rho=0							
	CELLAREA	PGDNA	DENSITY	AVGOPTIC	SUMOPTIC	SHAPE	PERIMETE
ANGULARS ANGULAR SECOND MOMENT	0.34803 <.0001	-0.11105 0.1175	-0.35032 <.0001	-0.35136 <.0001	-0.11041 0.1196	0.19446 0.0058	0.34229 <.0001
CORRELAT CORRELATION	0.11878 0.0939	0.03196 0.6532	-0.11448 0.1065	-0.11613 0.1015	0.03174 0.6555	0.10254 0.1485	0.11881 0.0938
COEFFICI COEFF of VARIATION	-0.88331 <.0001	0.37007 <.0001	0.88486 <.0001	0.88855 <.0001	0.36935 <.0001	-0.49506 <.0001	-0.86906 <.0001
DIFFE002 DIFFERENCE ENTROPY	-0.22292 0.0015	-0.05116 0.4719	0.20987 0.0029	0.21315 0.0024	-0.05129 0.4708	-0.13558 0.0556	-0.21902 0.0018
ENTROPY ENTROPY	-0.26827 0.0001	0.02742 0.7000	0.26384 0.0002	0.26553 0.0001	0.02712 0.7031	-0.18588 0.0084	-0.26964 0.0001
INFOMEAS INFO MEASURE A	-0.20392 0.0038	-0.00760 0.9150	0.19907 0.0047	0.20064 0.0044	-0.00792 0.9114	-0.11471 0.1058	-0.20222 0.0041
INFOM001 INFO MEASURE B	0.20091 0.0043	0.01881 0.7915	-0.19449 0.0058	-0.19565 0.0055	0.01921 0.7872	0.11619 0.1013	0.19938 0.0046
MAXIMALC MAX CORR COEFF	0.25706 0.0002	0.00394 0.9558	-0.24684 0.0004	-0.25009 0.0004	0.00354 0.9604	0.18643 0.0082	0.25283 0.0003
PRODUCTM PRODUCT MOMENT	-0.97290 <.0001	0.40935 <.0001	0.97938 <.0001	0.98113 <.0001	0.40859 <.0001	-0.58212 <.0001	-0.96325 <.0001
SUMVARIA SUM VARIANCE	-0.97500 <.0001	0.40845 <.0001	0.98147 <.0001	0.98321 <.0001	0.40768 <.0001	-0.58297 <.0001	-0.96516 <.0001
SUMAVERA SUM AVERAGE	-0.98954 <.0001	0.41568 <.0001	0.99826 <.0001	0.99941 <.0001	0.41493 <.0001	-0.61367 <.0001	-0.98291 <.0001
CONTRAST CONTRAST	-0.98267 <.0001	0.39932 <.0001	0.98802 <.0001	0.99016 <.0001	0.39855 <.0001	-0.59260 <.0001	-0.97359 <.0001
DIAGO001 DIAGONAL MOMENT	-0.95637 <.0001	0.38362 <.0001	0.96154 <.0001	0.96373 <.0001	0.38282 <.0001	-0.57256 <.0001	-0.94770 <.0001
DIAGONAL DIAGONAL VARIANCE	0.25237 0.0003	-0.21477 0.0023	-0.26047 0.0002	-0.26849 0.0001	-0.21684 0.0020	0.25892 0.0002	0.25852 0.0002
DIFFEREN DIFFERENCE MOMENT	-0.98431 <.0001	0.40199 <.0001	0.99008 <.0001	0.99184 <.0001	0.40118 <.0001	-0.59421 <.0001	-0.97516 <.0001
DIFFE001 DIFFERENCE VARIANCE	-0.97887 <.0001	0.39428 <.0001	0.98364 <.0001	0.98614 <.0001	0.39353 <.0001	-0.59138 <.0001	-0.96969 <.0001

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The CORR Procedure

Spearman Correlation Coefficients, N = 200 Prob > r under H0: Rho=0							
	CELLAREA	PGDNA	DENSITY	AVGOPTIC	SUMOPTIC	SHAPE	PERIMETE
INVERSED INVERSE DIFFERENCE MOMENT	0.80132 <.0001	-0.31518 <.0001	-0.80438 <.0001	-0.80306 <.0001	-0.31473 <.0001	0.48567 <.0001	0.79237 <.0001
PEAKTRAN PEAK TRANSITIONAL PROB	0.36789 <.0001	-0.21397 0.0023	-0.37465 <.0001	-0.37940 <.0001	-0.21535 0.0022	0.30549 <.0001	0.37177 <.0001
TRIANGUL TRIANGULAR SYMMETRY	-0.42879 <.0001	0.23689 0.0007	0.43204 <.0001	0.43900 <.0001	0.23810 0.0007	-0.31320 <.0001	-0.42512 <.0001
SECONDDI SECOND DIAG MOMENT	-0.98428 <.0001	0.40200 <.0001	0.99004 <.0001	0.99181 <.0001	0.40119 <.0001	-0.59435 <.0001	-0.97514 <.0001
SUMENTRO SUM ENTROPY	0.18356 0.0093	0.03876 0.5858	-0.17726 0.0120	-0.17731 0.0120	0.04059 0.5683	0.05407 0.4470	0.17716 0.0121

Spearman Correlation Coefficients, N = 200 Prob > r under H0: Rho=0						
	ELONGATI	MINDIAME	MAXDIAME	CELLFERE	CELLF001	RUNLENGT
CELLAREA CELL AREA	-0.03653 0.6076	0.90818 <.0001	0.95072 <.0001	0.88696 <.0001	0.92338 <.0001	0.98890 <.0001
PGDNA Pg DNA	0.00522 0.9416	-0.27039 0.0001	-0.30817 <.0001	-0.25200 0.0003	-0.33019 <.0001	-0.26911 0.0001
DENSITY DENSITY	0.04220 0.5530	-0.90052 <.0001	-0.93982 <.0001	-0.87374 <.0001	-0.91655 <.0001	-0.97328 <.0001
AVGOPTIC AVG OPTICAL DENSITY	0.04261 0.5491	-0.90048 <.0001	-0.94008 <.0001	-0.87575 <.0001	-0.91678 <.0001	-0.97308 <.0001
SUMOPTIC SUM OPTICAL DENSITY	0.00328 0.9633	-0.26951 0.0001	-0.30794 <.0001	-0.25140 0.0003	-0.32952 <.0001	-0.26817 0.0001
SHAPE SHAPE	0.42670 <.0001	0.39068 <.0001	0.71991 <.0001	0.57464 <.0001	0.63708 <.0001	0.61422 <.0001
PERIMETE PERIMETER	0.02113 0.7665	0.87416 <.0001	0.96244 <.0001	0.88079 <.0001	0.92973 <.0001	0.98390 <.0001
ELONGATI ELONGATION	1.00000	-0.36233 <.0001	0.22982 0.0011	-0.03503 0.6224	-0.00122 0.9863	-0.01327 0.8520
MINDIAME MIN DIAMETER	-0.36233 <.0001	1.00000	0.76684 <.0001	0.85347 <.0001	0.80479 <.0001	0.88907 <.0001

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Spearman Correlation Coefficients, N = 200 Prob > r under H0: Rho=0						
	ELONGATI	MINDIAME	MAXDIAME	CELLFERE	CELLF001	RUNLENGT
MAXDIAME MAX DIAMETER	0.22982 0.0011	0.76684 <.0001	1.00000	0.85686 <.0001	0.87819 <.0001	0.94548 <.0001
CELLFERE CELL FERET Y	-0.03503 0.6224	0.85347 <.0001	0.85686 <.0001	1.00000	0.68776 <.0001	0.87072 <.0001
CELLF001 CELL FERET X	-0.00122 0.9863	0.80479 <.0001	0.87819 <.0001	0.68776 <.0001	1.00000	0.92291 <.0001
RUNLENGT RUN LENGTH	-0.01327 0.8520	0.88907 <.0001	0.94548 <.0001	0.87072 <.0001	0.92291 <.0001	1.00000
CFGRUNLE CFG RUN LENGTH	-0.09584 0.1770	0.73727 <.0001	0.74058 <.0001	0.77868 <.0001	0.64731 <.0001	0.75551 <.0001
VALLEY VALLEY	-0.08722 0.2194	0.73965 <.0001	0.75135 <.0001	0.77239 <.0001	0.66168 <.0001	0.76691 <.0001
PEAK PEAK	-0.03053 0.6678	0.75003 <.0001	0.79942 <.0001	0.76667 <.0001	0.73299 <.0001	0.81988 <.0001
SLOPE SLOPE	-0.00230 0.9743	0.87125 <.0001	0.92000 <.0001	0.85169 <.0001	0.90260 <.0001	0.96908 <.0001
STANDARD STANDARD DEV	0.06298 0.3756	-0.89734 <.0001	-0.92891 <.0001	-0.87237 <.0001	-0.89987 <.0001	-0.95865 <.0001
ANGULARS ANGULAR SECOND MOMENT	-0.02556 0.7194	0.35422 <.0001	0.30860 <.0001	0.33204 <.0001	0.30569 <.0001	0.34972 <.0001
CORRELAT CORRELATION	0.04279 0.5475	0.14578 0.0394	0.09949 0.1610	0.18821 0.0076	0.06378 0.3696	0.13612 0.0546
COEFFICI COEFF of VARIATION	0.09411 0.1850	-0.81208 <.0001	-0.83032 <.0001	-0.78725 <.0001	-0.80181 <.0001	-0.84852 <.0001
DIFFE002 DIFFERENCE ENTROPY	0.00422 0.9527	-0.24679 0.0004	-0.19968 0.0046	-0.31047 <.0001	-0.13004 0.0665	-0.22547 0.0013
ENTROPY ENTROPY	-0.01901 0.7893	-0.26491 0.0002	-0.24723 0.0004	-0.29376 <.0001	-0.21458 0.0023	-0.26765 0.0001
INFOMEAS INFO MEASURE A	-0.01204 0.8656	-0.21530 0.0022	-0.18039 0.0106	-0.23021 0.0010	-0.15146 0.0323	-0.20403 0.0038
INFOM001 INFO MEASURE B	0.01761 0.8045	0.20599 0.0034	0.17747 0.0119	0.22937 0.0011	0.14830 0.0361	0.20208 0.0041
MAXIMALC MAX CORR COEFF	0.03230 0.6498	0.25790 0.0002	0.24064 0.0006	0.30042 <.0001	0.16517 0.0194	0.24931 0.0004

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Spearman Correlation Coefficients, N = 200 Prob > r under H0: Rho=0						
	ELONGATI	MINDIAME	MAXDIAME	CELLFERE	CELLF001	RUNLENGT
PRODUCTM PRODUCT MOMENT	0.05849 0.4107	-0.88802 <.0001	-0.92437 <.0001	-0.86280 <.0001	-0.89623 <.0001	-0.95082 <.0001
SUMVARIA SUM VARIANCE	0.06022 0.3970	-0.89080 <.0001	-0.92571 <.0001	-0.86574 <.0001	-0.89735 <.0001	-0.95292 <.0001
SUMAVERA SUM AVERAGE	0.04294 0.5460	-0.90136 <.0001	-0.94082 <.0001	-0.87664 <.0001	-0.91743 <.0001	-0.97483 <.0001
CONTRAST CONTRAST	0.05835 0.4118	-0.90451 <.0001	-0.92869 <.0001	-0.88293 <.0001	-0.89865 <.0001	-0.96264 <.0001
DIAGO001 DIAGONAL MOMENT	0.05744 0.4192	-0.88376 <.0001	-0.90053 <.0001	-0.86318 <.0001	-0.87107 <.0001	-0.93756 <.0001
DIAGONAL DIAGONAL VARIANCE	0.05296 0.4564	0.21128 0.0027	0.26661 0.0001	0.27682 <.0001	0.22482 0.0014	0.24103 0.0006
DIFFEREN DIFFERENCE MOMENT	0.05519 0.4376	-0.90303 <.0001	-0.93085 <.0001	-0.87506 <.0001	-0.90437 <.0001	-0.96317 <.0001
DIFFE001 DIFFERENCE VARIANCE	0.05860 0.4098	-0.90423 <.0001	-0.92561 <.0001	-0.88989 <.0001	-0.89027 <.0001	-0.95994 <.0001
INVERSE INVERSE DIFFERENCE MOMENT	-0.03809 0.5923	0.72673 <.0001	0.74603 <.0001	0.65164 <.0001	0.77086 <.0001	0.78191 <.0001
PEAKTRAN PEAK TRANSITIONAL PROB	0.06432 0.3656	0.30741 <.0001	0.36974 <.0001	0.35540 <.0001	0.33350 <.0001	0.35954 <.0001
TRIANGUL TRIANGULAR SYMMETRY	-0.01696 0.8115	-0.40216 <.0001	-0.41687 <.0001	-0.45258 <.0001	-0.35723 <.0001	-0.41689 <.0001
SECONDDI SECOND DIAG MOMENT	0.05495 0.4397	-0.90295 <.0001	-0.93090 <.0001	-0.87511 <.0001	-0.90421 <.0001	-0.96313 <.0001
SUMENTRO SUM ENTROPY	-0.06598 0.3533	0.18980 0.0071	0.14303 0.0433	0.15917 0.0244	0.16272 0.0213	0.19191 0.0065

Spearman Correlation Coefficients, N = 200 Prob > r under H0: Rho=0							
	CFGRUNLE	VALLEY	PEAK	SLOPE	STANDARD	ANGULARS	CORRELAT
CELLAREA CELL AREA	0.77778 <.0001	0.78665 <.0001	0.82616 <.0001	0.96526 <.0001	-0.97941 <.0001	0.34803 <.0001	0.11878 0.0939

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Spearman Correlation Coefficients, N = 200 Prob > r under H0: Rho=0							
	CFGRUNLE	VALLEY	PEAK	SLOPE	STANDARD	ANGULARS	CORRELAT
PGDNA Pg DNA	-0.18143 0.0101	-0.17486 0.0133	-0.12984 0.0669	-0.26671 0.0001	0.40739 <.0001	-0.11105 0.1175	0.03196 0.6532
DENSITY DENSITY	-0.75809 <.0001	-0.76607 <.0001	-0.79764 <.0001	-0.95019 <.0001	0.98583 <.0001	-0.35032 <.0001	-0.11448 0.1065
AVGOPTIC AVG OPTICAL DENSITY	-0.75609 <.0001	-0.76409 <.0001	-0.79561 <.0001	-0.95073 <.0001	0.98724 <.0001	-0.35136 <.0001	-0.11613 0.1015
SUMOPTIC SUM OPTICAL DENSITY	-0.18041 0.0106	-0.17376 0.0139	-0.12887 0.0690	-0.26601 0.0001	0.40664 <.0001	-0.11041 0.1196	0.03174 0.6555
SHAPE SHAPE	0.43452 <.0001	0.44274 <.0001	0.50836 <.0001	0.60482 <.0001	-0.58308 <.0001	0.19446 0.0058	0.10254 0.1485
PERIMETE PERIMETER	0.76377 <.0001	0.77431 <.0001	0.82039 <.0001	0.96038 <.0001	-0.96868 <.0001	0.34229 <.0001	0.11881 0.0938
ELONGATI ELONGATION	-0.09584 0.1770	-0.08722 0.2194	-0.03053 0.6678	-0.00230 0.9743	0.06298 0.3756	-0.02556 0.7194	0.04279 0.5475
MINDIAME MIN DIAMETER	0.73727 <.0001	0.73965 <.0001	0.75003 <.0001	0.87125 <.0001	-0.89734 <.0001	0.35422 <.0001	0.14578 0.0394
MAXDIAME MAX DIAMETER	0.74058 <.0001	0.75135 <.0001	0.79942 <.0001	0.92000 <.0001	-0.92891 <.0001	0.30860 <.0001	0.09949 0.1610
CELLFERE CELL FERET Y	0.77868 <.0001	0.77239 <.0001	0.76667 <.0001	0.85169 <.0001	-0.87237 <.0001	0.33204 <.0001	0.18821 0.0076
CELLF001 CELL FERET X	0.64731 <.0001	0.66168 <.0001	0.73299 <.0001	0.90260 <.0001	-0.89987 <.0001	0.30569 <.0001	0.06378 0.3696
RUNLENGT RUN LENGTH	0.75551 <.0001	0.76691 <.0001	0.81988 <.0001	0.96908 <.0001	-0.95865 <.0001	0.34972 <.0001	0.13612 0.0546
CFGRUNLE CFG RUN LENGTH	1.00000	0.99475 <.0001	0.96041 <.0001	0.62206 <.0001	-0.80646 <.0001	-0.02406 0.7352	-0.31309 <.0001
VALLEY VALLEY	0.99475 <.0001	1.00000	0.96866 <.0001	0.63107 <.0001	-0.81340 <.0001	-0.01142 0.8725	-0.30988 <.0001
PEAK PEAK	0.96041 <.0001	0.96866 <.0001	1.00000	0.69384 <.0001	-0.83065 <.0001	0.02691 0.7052	-0.25643 0.0002
SLOPE SLOPE	0.62206 <.0001	0.63107 <.0001	0.69384 <.0001	1.00000	-0.91831 <.0001	0.45320 <.0001	0.30863 <.0001
STANDARD STANDARD DEV	-0.80646 <.0001	-0.81340 <.0001	-0.83065 <.0001	-0.91831 <.0001	1.00000	-0.29848 <.0001	-0.01795 0.8008

Supplemental Data

Wolfe P, Murphy J, McGinley J, Zhu Z, Jiang W, Gottschall EB, Thompson HJ. (2004) Using nuclear morphometry to discriminate the tumorigenic potential of cells: a comparison of statistical methods. *Cancer Epidemiol Biomarkers Prev.* Jun;13(6):976-88

The SAS System

The CORR Procedure

Spearman Correlation Coefficients, N = 200 Prob > r under H0: Rho=0							
	CFGRUNLE	VALLEY	PEAK	SLOPE	STANDARD	ANGULARS	CORRELAT
ANGULARS ANGULAR SECOND MOMENT	-0.02406 0.7352	-0.01142 0.8725	0.02691 0.7052	0.45320 <.0001	-0.29848 <.0001	1.00000	0.63391 <.0001
CORRELAT CORRELATION	-0.31309 <.0001	-0.30988 <.0001	-0.25643 0.0002	0.30863 <.0001	-0.01795 0.8008	0.63391 <.0001	1.00000
COEFFICI COEFF of VARIATION	-0.82287 <.0001	-0.82792 <.0001	-0.81647 <.0001	-0.77762 <.0001	0.94417 <.0001	-0.15085 0.0330	0.18443 0.0089
DIFFE002 DIFFERENCE ENTROPY	0.18153 0.0101	0.18072 0.0104	0.14952 0.0346	-0.38765 <.0001	0.13975 0.0484	-0.58460 <.0001	-0.91559 <.0001
ENTROPY ENTROPY	0.18171 0.0100	0.17212 0.0148	0.12253 0.0839	-0.42288 <.0001	0.18853 0.0075	-0.78929 <.0001	-0.87365 <.0001
INFOMEAS INFO MEASURE A	0.24568 0.0005	0.23501 0.0008	0.18398 0.0091	-0.36822 <.0001	0.11950 0.0919	-0.74784 <.0001	-0.89536 <.0001
INFOM001 INFO MEASURE B	-0.24122 0.0006	-0.23163 0.0010	-0.18123 0.0102	0.36381 <.0001	-0.11747 0.0976	0.73302 <.0001	0.88438 <.0001
MAXIMALC MAX CORR COEFF	-0.11700 0.0990	-0.11113 0.1172	-0.07122 0.3162	0.39431 <.0001	-0.18008 0.0107	0.65070 <.0001	0.81985 <.0001
PRODUCTM PRODUCT MOMENT	-0.81518 <.0001	-0.82195 <.0001	-0.83658 <.0001	-0.90403 <.0001	0.99802 <.0001	-0.27372 <.0001	0.01801 0.8002
SUMVARIA SUM VARIANCE	-0.81023 <.0001	-0.81718 <.0001	-0.83212 <.0001	-0.90903 <.0001	0.99855 <.0001	-0.28338 <.0001	0.00406 0.9545
SUMAVERA SUM AVERAGE	-0.75981 <.0001	-0.76784 <.0001	-0.79958 <.0001	-0.95172 <.0001	0.98799 <.0001	-0.35341 <.0001	-0.11403 0.1079
CONTRAST CONTRAST	-0.73576 <.0001	-0.74346 <.0001	-0.76864 <.0001	-0.95208 <.0001	0.98594 <.0001	-0.39092 <.0001	-0.15946 0.0241
DIAGO001 DIAGONAL MOMENT	-0.63616 <.0001	-0.64465 <.0001	-0.67518 <.0001	-0.95998 <.0001	0.94423 <.0001	-0.48580 <.0001	-0.29892 <.0001
DIAGONAL DIAGONAL VARIANCE	0.04766 0.5027	0.05182 0.4661	0.07233 0.3088	0.28654 <.0001	-0.25818 0.0002	0.53396 <.0001	0.27581 <.0001
DIFFEREN DIFFERENCE MOMENT	-0.73738 <.0001	-0.74622 <.0001	-0.77303 <.0001	-0.95109 <.0001	0.98652 <.0001	-0.39630 <.0001	-0.14901 0.0352
DIFFE001 DIFFERENCE VARIANCE	-0.73381 <.0001	-0.74021 <.0001	-0.76364 <.0001	-0.95083 <.0001	0.98301 <.0001	-0.38358 <.0001	-0.16585 0.0189

Supplemental Data

Wolfe P, Murphy J, McGinley J, Zhu Z, Jiang W, Gottschall EB, Thompson HJ. (2004) Using nuclear morphometry to discriminate the tumorigenic potential of cells: a comparison of statistical methods. *Cancer Epidemiol Biomarkers Prev.* Jun;13(6):976-88

The SAS System

The CORR Procedure

Spearman Correlation Coefficients, N = 200 Prob > r under H0: Rho=0							
	CFGRUNLE	VALLEY	PEAK	SLOPE	STANDARD	ANGULARS	CORRELAT
INVERSED INVERSE DIFFERENCE MOMENT	0.46428 <.0001	0.48217 <.0001	0.53066 <.0001	0.81054 <.0001	-0.76955 <.0001	0.57101 <.0001	0.30769 <.0001
PEAKTRAN PEAK TRANSITIONAL PROB	0.10882 0.1251	0.11595 0.1020	0.15120 0.0326	0.41243 <.0001	-0.35804 <.0001	0.58472 <.0001	0.33890 <.0001
TRIANGUL TRIANGULAR SYMMETRY	-0.31781 <.0001	-0.30755 <.0001	-0.29342 <.0001	-0.43061 <.0001	0.42606 <.0001	-0.16487 0.0196	-0.25085 0.0003
SECONDDI SECOND DIAG MOMENT	-0.73729 <.0001	-0.74612 <.0001	-0.77296 <.0001	-0.95109 <.0001	0.98648 <.0001	-0.39647 <.0001	-0.14912 0.0351
SUMENTRO SUM ENTROPY	0.17559 0.0129	0.17778 0.0118	0.16872 0.0169	0.18263 0.0096	-0.18213 0.0098	-0.20265 0.0040	-0.04052 0.5689

Spearman Correlation Coefficients, N = 200 Prob > r under H0: Rho=0							
	COEFFICI	DIFFE002	ENTROPY	INFOMEAS	INFOM001	MAXIMALC	PRODUCTM
CELLAREA CELL AREA	-0.88331 <.0001	-0.22292 0.0015	-0.26827 0.0001	-0.20392 0.0038	0.20091 0.0043	0.25706 0.0002	-0.97290 <.0001
PGDNA Pg DNA	0.37007 <.0001	-0.05116 0.4719	0.02742 0.7000	-0.00760 0.9150	0.01881 0.7915	0.00394 0.9558	0.40935 <.0001
DENSITY DENSITY	0.88486 <.0001	0.20987 0.0029	0.26384 0.0002	0.19907 0.0047	-0.19449 0.0058	-0.24684 0.0004	0.97938 <.0001
AVGOPTIC AVG OPTICAL DENSITY	0.88855 <.0001	0.21315 0.0024	0.26553 0.0001	0.20064 0.0044	-0.19565 0.0055	-0.25009 0.0004	0.98113 <.0001
SUMOPTIC SUM OPTICAL DENSITY	0.36935 <.0001	-0.05129 0.4708	0.02712 0.7031	-0.00792 0.9114	0.01921 0.7872	0.00354 0.9604	0.40859 <.0001
SHAPE SHAPE	-0.49506 <.0001	-0.13558 0.0556	-0.18588 0.0084	-0.11471 0.1058	0.11619 0.1013	0.18643 0.0082	-0.58212 <.0001
PERIMETE PERIMETER	-0.86906 <.0001	-0.21902 0.0018	-0.26964 0.0001	-0.20222 0.0041	0.19938 0.0046	0.25283 0.0003	-0.96325 <.0001
ELONGATI ELONGATION	0.09411 0.1850	0.00422 0.9527	-0.01901 0.7893	-0.01204 0.8656	0.01761 0.8045	0.03230 0.6498	0.05849 0.4107
MINDIAME MIN DIAMETER	-0.81208 <.0001	-0.24679 0.0004	-0.26491 0.0002	-0.21530 0.0022	0.20599 0.0034	0.25790 0.0002	-0.88802 <.0001

Wolfe P, Murphy J, McGinley J, Zhu Z, Jiang W, Gottschall EB, Thompson HJ. (2004) Using nuclear morphometry to discriminate the tumorigenic potential of cells: a comparison of statistical methods. *Cancer Epidemiol Biomarkers Prev.* Jun;13(6):976-88

The SAS System

The CORR Procedure

Spearman Correlation Coefficients, N = 200 Prob > r under H0: Rho=0							
	COEFFICI	DIFFE002	ENTROPY	INFOMEAS	INFOM001	MAXIMALC	PRODUCTM
MAXDIAME MAX DIAMETER	-0.83032 <.0001	-0.19968 0.0046	-0.24723 0.0004	-0.18039 0.0106	0.17747 0.0119	0.24064 0.0006	-0.92437 <.0001
CELLFERE CELL FERET Y	-0.78725 <.0001	-0.31047 <.0001	-0.29376 <.0001	-0.23021 0.0010	0.22937 0.0011	0.30042 <.0001	-0.86280 <.0001
CELLF001 CELL FERET X	-0.80181 <.0001	-0.13004 0.0665	-0.21458 0.0023	-0.15146 0.0323	0.14830 0.0361	0.16517 0.0194	-0.89623 <.0001
RUNLENGT RUN LENGTH	-0.84852 <.0001	-0.22547 0.0013	-0.26765 0.0001	-0.20403 0.0038	0.20208 0.0041	0.24931 0.0004	-0.95082 <.0001
CFGRUNLE CFG RUN LENGTH	-0.82287 <.0001	0.18153 0.0101	0.18171 0.0100	0.24568 0.0005	-0.24122 0.0006	-0.11700 0.0990	-0.81518 <.0001
VALLEY VALLEY	-0.82792 <.0001	0.18072 0.0104	0.17212 0.0148	0.23501 0.0008	-0.23163 0.0010	-0.11113 0.1172	-0.82195 <.0001
PEAK PEAK	-0.81647 <.0001	0.14952 0.0346	0.12253 0.0839	0.18398 0.0091	-0.18123 0.0102	-0.07122 0.3162	-0.83658 <.0001
SLOPE SLOPE	-0.77762 <.0001	-0.38765 <.0001	-0.42288 <.0001	-0.36822 <.0001	0.36381 <.0001	0.39431 <.0001	-0.90403 <.0001
STANDARD STANDARD DEV	0.94417 <.0001	0.13975 0.0484	0.18853 0.0075	0.11950 0.0919	-0.11747 0.0976	-0.18008 0.0107	0.99802 <.0001
ANGULARS ANGULAR SECOND MOMENT	-0.15085 0.0330	-0.58460 <.0001	-0.78929 <.0001	-0.74784 <.0001	0.73302 <.0001	0.65070 <.0001	-0.27372 <.0001
CORRELAT CORRELATION	0.18443 0.0089	-0.91559 <.0001	-0.87365 <.0001	-0.89536 <.0001	0.88438 <.0001	0.81985 <.0001	0.01801 0.8002
COEFFICI COEFF of VARIATION	1.00000	-0.02196 0.7576	0.01407 0.8433	-0.06115 0.3897	0.06062 0.3938	-0.02058 0.7723	0.95622 <.0001
DIFFE002 DIFFERENCE ENTROPY	-0.02196 0.7576	1.00000	0.86244 <.0001	0.87075 <.0001	-0.86218 <.0001	-0.81458 <.0001	0.10766 0.1292
ENTROPY ENTROPY	0.01407 0.8433	0.86244 <.0001	1.00000	0.96698 <.0001	-0.95788 <.0001	-0.83826 <.0001	0.15788 0.0256
INFOMEAS INFO MEASURE A	-0.06115 0.3897	0.87075 <.0001	0.96698 <.0001	1.00000	-0.98653 <.0001	-0.83438 <.0001	0.08641 0.2238
INFOM001 INFO MEASURE B	0.06062 0.3938	-0.86218 <.0001	-0.95788 <.0001	-0.98653 <.0001	1.00000	0.83193 <.0001	-0.08416 0.2361
MAXIMALC MAX CORR COEFF	-0.02058 0.7723	-0.81458 <.0001	-0.83826 <.0001	-0.83438 <.0001	0.83193 <.0001	1.00000	-0.15285 0.0307

Supplemental Data

Wolfe P, Murphy J, McGinley J, Zhu Z, Jiang W, Gottschall EB, Thompson HJ. (2004) Using nuclear morphometry to discriminate the tumorigenic potential of cells: a comparison of statistical methods. *Cancer Epidemiol Biomarkers Prev.* Jun;13(6):976-88

The SAS System

The CORR Procedure

Spearman Correlation Coefficients, N = 200
Prob > |r| under H0: Rho=0

	COEFFICI	DIFFE002	ENTROPY	INFOMEAS	INFOM001	MAXIMALC	PRODUCTM
PRODUCTM PRODUCT MOMENT	0.95622 <.0001	0.10766 0.1292	0.15788 0.0256	0.08641 0.2238	-0.08416 0.2361	-0.15285 0.0307	1.00000
SUMVARIA SUM VARIANCE	0.95343 <.0001	0.12128 0.0871	0.17089 0.0155	0.09991 0.1593	-0.09733 0.1704	-0.16456 0.0199	0.99978 <.0001
SUMAVERA SUM AVERAGE	0.89007 <.0001	0.21039 0.0028	0.26460 0.0002	0.20028 0.0045	-0.19584 0.0054	-0.24945 0.0004	0.98194 <.0001
CONTRAST CONTRAST	0.90413 <.0001	0.27201 <.0001	0.31566 <.0001	0.24830 0.0004	-0.24454 0.0005	-0.29892 <.0001	0.98001 <.0001
DIAGO001 DIAGONAL MOMENT	0.83521 <.0001	0.40236 <.0001	0.45739 <.0001	0.39514 <.0001	-0.39067 <.0001	-0.42171 <.0001	0.93313 <.0001
DIAGONAL DIAGONAL VARIANCE	-0.23216 0.0009	-0.19000 0.0070	-0.41206 <.0001	-0.30794 <.0001	0.29274 <.0001	0.32590 <.0001	-0.25587 0.0003
DIFFEREN DIFFERENCE MOMENT	0.90046 <.0001	0.25528 0.0003	0.31629 <.0001	0.25197 0.0003	-0.24852 0.0004	-0.29170 <.0001	0.98028 <.0001
DIFFE001 DIFFERENCE VARIANCE	0.90472 <.0001	0.28483 <.0001	0.31147 <.0001	0.24181 0.0006	-0.23803 0.0007	-0.30196 <.0001	0.97736 <.0001
INVERSED INVERSE DIFFERENCE MOMENT	-0.63014 <.0001	-0.30328 <.0001	-0.51590 <.0001	-0.46977 <.0001	0.46585 <.0001	0.42210 <.0001	-0.75329 <.0001
PEAKTRAN PEAK TRANSITIONAL PROB	-0.29207 <.0001	-0.23214 0.0009	-0.43043 <.0001	-0.36648 <.0001	0.36160 <.0001	0.36122 <.0001	-0.34820 <.0001
TRIANGUL TRIANGULAR SYMMETRY	0.37293 <.0001	0.31421 <.0001	0.14687 0.0380	0.09675 0.1729	-0.08178 0.2496	-0.21520 0.0022	0.42109 <.0001
SECONDDI SECOND DIAG MOMENT	0.90040 <.0001	0.25540 0.0003	0.31647 <.0001	0.25218 0.0003	-0.24872 0.0004	-0.29180 <.0001	0.98023 <.0001
SUMENTRO SUM ENTROPY	-0.18190 0.0099	-0.02865 0.6872	0.13940 0.0490	0.04046 0.5695	-0.02484 0.7270	-0.09743 0.1699	-0.17586 0.0127

Spearman Correlation Coefficients, N = 200
Prob > |r| under H0: Rho=0

	SUMVARIA	SUMAVERA	CONTRAST	DIAGO001	DIAGONAL	DIFFEREN	DIFFE001
CELLAREA CELL AREA	-0.97500 <.0001	-0.98954 <.0001	-0.98267 <.0001	-0.95637 <.0001	0.25237 0.0003	-0.98431 <.0001	-0.97887 <.0001

Supplemental Data

Wolfe P, Murphy J, McGinley J, Zhu Z, Jiang W, Gottschall EB, Thompson HJ. (2004) Using nuclear morphometry to discriminate the tumorigenic potential of cells: a comparison of statistical methods. *Cancer Epidemiol Biomarkers Prev.* Jun;13(6):976-88

The SAS System

The CORR Procedure

Spearman Correlation Coefficients, N = 200 Prob > r under H0: Rho=0							
	SUMVARIA	SUMAVERA	CONTRAST	DIAGO001	DIAGONAL	DIFFEREN	DIFFE001
PGDNA Pg DNA	0.40845 <.0001	0.41568 <.0001	0.39932 <.0001	0.38362 <.0001	-0.21477 0.0023	0.40199 <.0001	0.39428 <.0001
DENSITY DENSITY	0.98147 <.0001	0.99826 <.0001	0.98802 <.0001	0.96154 <.0001	-0.26047 0.0002	0.99008 <.0001	0.98364 <.0001
AVGOPTIC AVG OPTICAL DENSITY	0.98321 <.0001	0.99941 <.0001	0.99016 <.0001	0.96373 <.0001	-0.26849 0.0001	0.99184 <.0001	0.98614 <.0001
SUMOPTIC SUM OPTICAL DENSITY	0.40768 <.0001	0.41493 <.0001	0.39855 <.0001	0.38282 <.0001	-0.21684 0.0020	0.40118 <.0001	0.39353 <.0001
SHAPE SHAPE	-0.58297 <.0001	-0.61367 <.0001	-0.59260 <.0001	-0.57256 <.0001	0.25892 0.0002	-0.59421 <.0001	-0.59138 <.0001
PERIMETE PERIMETER	-0.96516 <.0001	-0.98291 <.0001	-0.97359 <.0001	-0.94770 <.0001	0.25852 0.0002	-0.97516 <.0001	-0.96969 <.0001
ELONGATI ELONGATION	0.06022 0.3970	0.04294 0.5460	0.05835 0.4118	0.05744 0.4192	0.05296 0.4564	0.05519 0.4376	0.05860 0.4098
MINDIAME MIN DIAMETER	-0.89080 <.0001	-0.90136 <.0001	-0.90451 <.0001	-0.88376 <.0001	0.21128 0.0027	-0.90303 <.0001	-0.90423 <.0001
MAXDIAME MAX DIAMETER	-0.92571 <.0001	-0.94082 <.0001	-0.92869 <.0001	-0.90053 <.0001	0.26661 0.0001	-0.93085 <.0001	-0.92561 <.0001
CELLFERE CELL FERET Y	-0.86574 <.0001	-0.87664 <.0001	-0.88293 <.0001	-0.86318 <.0001	0.27682 <.0001	-0.87506 <.0001	-0.88989 <.0001
CELLF001 CELL FERET X	-0.89735 <.0001	-0.91743 <.0001	-0.89865 <.0001	-0.87107 <.0001	0.22482 0.0014	-0.90437 <.0001	-0.89027 <.0001
RUNLENGT RUN LENGTH	-0.95292 <.0001	-0.97483 <.0001	-0.96264 <.0001	-0.93756 <.0001	0.24103 0.0006	-0.96317 <.0001	-0.95994 <.0001
CFGRUNLE CFG RUN LENGTH	-0.81023 <.0001	-0.75981 <.0001	-0.73576 <.0001	-0.63616 <.0001	0.04766 0.5027	-0.73738 <.0001	-0.73381 <.0001
VALLEY VALLEY	-0.81718 <.0001	-0.76784 <.0001	-0.74346 <.0001	-0.64465 <.0001	0.05182 0.4661	-0.74622 <.0001	-0.74021 <.0001
PEAK PEAK	-0.83212 <.0001	-0.79958 <.0001	-0.76864 <.0001	-0.67518 <.0001	0.07233 0.3088	-0.77303 <.0001	-0.76364 <.0001
SLOPE SLOPE	-0.90903 <.0001	-0.95172 <.0001	-0.95208 <.0001	-0.95998 <.0001	0.28654 <.0001	-0.95109 <.0001	-0.95083 <.0001
STANDARD STANDARD DEV	0.99855 <.0001	0.98799 <.0001	0.98594 <.0001	0.94423 <.0001	-0.25818 0.0002	0.98652 <.0001	0.98301 <.0001

Supplemental Data

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The SAS System

The CORR Procedure

Spearman Correlation Coefficients, N = 200 Prob > r under H0: Rho=0							
	SUMVARIA	SUMAVERA	CONTRAST	DIAGO001	DIAGONAL	DIFFEREN	DIFFE001
ANGULARS ANGULAR SECOND MOMENT	-0.28338 <.0001	-0.35341 <.0001	-0.39092 <.0001	-0.48580 <.0001	0.53396 <.0001	-0.39630 <.0001	-0.38358 <.0001
CORRELAT CORRELATION	0.00406 0.9545	-0.11403 0.1079	-0.15946 0.0241	-0.29892 <.0001	0.27581 <.0001	-0.14901 0.0352	-0.16585 0.0189
COEFFICI COEFF of VARIATION	0.95343 <.0001	0.89007 <.0001	0.90413 <.0001	0.83521 <.0001	-0.23216 0.0009	0.90046 <.0001	0.90472 <.0001
DIFFE002 DIFFERENCE ENTROPY	0.12128 0.0871	0.21039 0.0028	0.27201 <.0001	0.40236 <.0001	-0.19000 0.0070	0.25528 0.0003	0.28483 <.0001
ENTROPY ENTROPY	0.17089 0.0155	0.26460 0.0002	0.31566 <.0001	0.45739 <.0001	-0.41206 <.0001	0.31629 <.0001	0.31147 <.0001
INFOMEAS INFO MEASURE A	0.09991 0.1593	0.20028 0.0045	0.24830 0.0004	0.39514 <.0001	-0.30794 <.0001	0.25197 0.0003	0.24181 0.0006
INFOM001 INFO MEASURE B	-0.09733 0.1704	-0.19584 0.0054	-0.24454 0.0005	-0.39067 <.0001	0.29274 <.0001	-0.24852 0.0004	-0.23803 0.0007
MAXIMALC MAX CORR COEFF	-0.16456 0.0199	-0.24945 0.0004	-0.29892 <.0001	-0.42171 <.0001	0.32590 <.0001	-0.29170 <.0001	-0.30196 <.0001
PRODUCTM PRODUCT MOMENT	0.99978 <.0001	0.98194 <.0001	0.98001 <.0001	0.93313 <.0001	-0.25587 0.0003	0.98028 <.0001	0.97736 <.0001
SUMVARIA SUM VARIANCE	1.00000	0.98396 <.0001	0.98282 <.0001	0.93826 <.0001	-0.25842 0.0002	0.98301 <.0001	0.98019 <.0001
SUMAVERA SUM AVERAGE	0.98396 <.0001	1.00000	0.99060 <.0001	0.96391 <.0001	-0.26732 0.0001	0.99252 <.0001	0.98632 <.0001
CONTRAST CONTRAST	0.98282 <.0001	0.99060 <.0001	1.00000	0.98150 <.0001	-0.29703 <.0001	0.99778 <.0001	0.99802 <.0001
DIAGO001 DIAGONAL MOMENT	0.93826 <.0001	0.96391 <.0001	0.98150 <.0001	1.00000	-0.31295 <.0001	0.98035 <.0001	0.97889 <.0001
DIAGONAL DIAGONAL VARIANCE	-0.25842 0.0002	-0.26732 0.0001	-0.29703 <.0001	-0.31295 <.0001	1.00000	-0.29444 <.0001	-0.29660 <.0001
DIFFEREN DIFFERENCE MOMENT	0.98301 <.0001	0.99252 <.0001	0.99778 <.0001	0.98035 <.0001	-0.29444 <.0001	1.00000	0.99263 <.0001
DIFFE001 DIFFERENCE VARIANCE	0.98019 <.0001	0.98632 <.0001	0.99802 <.0001	0.97889 <.0001	-0.29660 <.0001	0.99263 <.0001	1.00000

Supplemental Data

Wolfe P, Murphy J, McGinley J, Zhu Z, Jiang W, Gottschall EB, Thompson HJ. (2004) Using nuclear morphometry to discriminate the tumorigenic potential of cells: a comparison of statistical methods. *Cancer Epidemiol Biomarkers Prev.* Jun;13(6):976-88

The SAS System

The CORR Procedure

Spearman Correlation Coefficients, N = 200 Prob > r under H0: Rho=0							
	SUMVARIA	SUMAVERA	CONTRAST	DIAGO001	DIAGONAL	DIFFEREN	DIFFE001
INVERSED INVERSE DIFFERENCE MOMENT	-0.75866 <.0001	-0.80571 <.0001	-0.80794 <.0001	-0.84419 <.0001	0.34994 <.0001	-0.83075 <.0001	-0.78258 <.0001
PEAKTRAN PEAK TRANSITIONAL PROB	-0.35167 <.0001	-0.37880 <.0001	-0.40128 <.0001	-0.42480 <.0001	0.86046 <.0001	-0.40474 <.0001	-0.39631 <.0001
TRIANGUL TRIANGULAR SYMMETRY	0.42456 <.0001	0.43540 <.0001	0.46023 <.0001	0.45224 <.0001	-0.27606 <.0001	0.44078 <.0001	0.47231 <.0001
SECONDDI SECOND DIAG MOMENT	0.98295 <.0001	0.99249 <.0001	0.99776 <.0001	0.98036 <.0001	-0.29455 <.0001	1.00000 <.0001	0.99259 <.0001
SUMENTRO SUM ENTROPY	-0.17670 0.0123	-0.17865 0.0114	-0.17380 0.0138	-0.16718 0.0180	-0.53649 <.0001	-0.17099 0.0155	-0.17386 0.0138

Spearman Correlation Coefficients, N = 200 Prob > r under H0: Rho=0					
	INVERSED	PEAKTRAN	TRIANGUL	SECONDDI	SUMENTRO
CELLAREA CELL AREA	0.80132 <.0001	0.36789 <.0001	-0.42879 <.0001	-0.98428 <.0001	0.18356 0.0093
PGDNA Pg DNA	-0.31518 <.0001	-0.21397 0.0023	0.23689 0.0007	0.40200 <.0001	0.03876 0.5858
DENSITY DENSITY	-0.80438 <.0001	-0.37465 <.0001	0.43204 <.0001	0.99004 <.0001	-0.17726 0.0120
AVGOPTIC AVG OPTICAL DENSITY	-0.80306 <.0001	-0.37940 <.0001	0.43900 <.0001	0.99181 <.0001	-0.17731 0.0120
SUMOPTIC SUM OPTICAL DENSITY	-0.31473 <.0001	-0.21535 0.0022	0.23810 0.0007	0.40119 <.0001	0.04059 0.5683
SHAPE SHAPE	0.48567 <.0001	0.30549 <.0001	-0.31320 <.0001	-0.59435 <.0001	0.05407 0.4470
PERIMETE PERIMETER	0.79237 <.0001	0.37177 <.0001	-0.42512 <.0001	-0.97514 <.0001	0.17716 0.0121
ELONGATI ELONGATION	-0.03809 0.5923	0.06432 0.3656	-0.01696 0.8115	0.05495 0.4397	-0.06598 0.3533
MINDIAME MIN DIAMETER	0.72673 <.0001	0.30741 <.0001	-0.40216 <.0001	-0.90295 <.0001	0.18980 0.0071

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The CORR Procedure

Spearman Correlation Coefficients, N = 200 Prob > r under H0: Rho=0					
	INVERSED	PEAKTRAN	TRIANGUL	SECONDDI	SUMENTRO
MAXDIAME MAX DIAMETER	0.74603 <.0001	0.36974 <.0001	-0.41687 <.0001	-0.93090 <.0001	0.14303 0.0433
CELLFERE CELL FERET Y	0.65164 <.0001	0.35540 <.0001	-0.45258 <.0001	-0.87511 <.0001	0.15917 0.0244
CELLF001 CELL FERET X	0.77086 <.0001	0.33350 <.0001	-0.35723 <.0001	-0.90421 <.0001	0.16272 0.0213
RUNLENGT RUN LENGTH	0.78191 <.0001	0.35954 <.0001	-0.41689 <.0001	-0.96313 <.0001	0.19191 0.0065
CFGRUNLE CFG RUN LENGTH	0.46428 <.0001	0.10882 0.1251	-0.31781 <.0001	-0.73729 <.0001	0.17559 0.0129
VALLEY VALLEY	0.48217 <.0001	0.11595 0.1020	-0.30755 <.0001	-0.74612 <.0001	0.17778 0.0118
PEAK PEAK	0.53066 <.0001	0.15120 0.0326	-0.29342 <.0001	-0.77296 <.0001	0.16872 0.0169
SLOPE SLOPE	0.81054 <.0001	0.41243 <.0001	-0.43061 <.0001	-0.95109 <.0001	0.18263 0.0096
STANDARD STANDARD DEV	-0.76955 <.0001	-0.35804 <.0001	0.42606 <.0001	0.98648 <.0001	-0.18213 0.0098
ANGULARS ANGULAR SECOND MOMENT	0.57101 <.0001	0.58472 <.0001	-0.16487 0.0196	-0.39647 <.0001	-0.20265 0.0040
CORRELAT CORRELATION	0.30769 <.0001	0.33890 <.0001	-0.25085 0.0003	-0.14912 0.0351	-0.04052 0.5689
COEFFICI COEFF of VARIATION	-0.63014 <.0001	-0.29207 <.0001	0.37293 <.0001	0.90040 <.0001	-0.18190 0.0099
DIFFE002 DIFFERENCE ENTROPY	-0.30328 <.0001	-0.23214 0.0009	0.31421 <.0001	0.25540 0.0003	-0.02865 0.6872
ENTROPY ENTROPY	-0.51590 <.0001	-0.43043 <.0001	0.14687 0.0380	0.31647 <.0001	0.13940 0.0490
INFOMEAS INFO MEASURE A	-0.46977 <.0001	-0.36648 <.0001	0.09675 0.1729	0.25218 0.0003	0.04046 0.5695
INFOM001 INFO MEASURE B	0.46585 <.0001	0.36160 <.0001	-0.08178 0.2496	-0.24872 0.0004	-0.02484 0.7270
MAXIMALC MAX CORR COEFF	0.42210 <.0001	0.36122 <.0001	-0.21520 0.0022	-0.29180 <.0001	-0.09743 0.1699

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The CORR Procedure

Spearman Correlation Coefficients, N = 200 Prob > r under H0: Rho=0					
	INVERSE	PEAKTRAN	TRIANGUL	SECONDDI	SUMENTRO
PRODUCTM PRODUCT MOMENT	-0.75329 <.0001	-0.34820 <.0001	0.42109 <.0001	0.98023 <.0001	-0.17586 0.0127
SUMVARIA SUM VARIANCE	-0.75866 <.0001	-0.35167 <.0001	0.42456 <.0001	0.98295 <.0001	-0.17670 0.0123
SUMAVERA SUM AVERAGE	-0.80571 <.0001	-0.37880 <.0001	0.43540 <.0001	0.99249 <.0001	-0.17865 0.0114
CONTRAST CONTRAST	-0.80794 <.0001	-0.40128 <.0001	0.46023 <.0001	0.99776 <.0001	-0.17380 0.0138
DIAGO001 DIAGONAL MOMENT	-0.84419 <.0001	-0.42480 <.0001	0.45224 <.0001	0.98036 <.0001	-0.16718 0.0180
DIAGONAL DIAGONAL VARIANCE	0.34994 <.0001	0.86046 <.0001	-0.27606 <.0001	-0.29455 <.0001	-0.53649 <.0001
DIFFEREN DIFFERENCE MOMENT	-0.83075 <.0001	-0.40474 <.0001	0.44078 <.0001	1.00000 <.0001	-0.17099 0.0155
DIFFE001 DIFFERENCE VARIANCE	-0.78258 <.0001	-0.39631 <.0001	0.47231 <.0001	0.99259 <.0001	-0.17386 0.0138
INVERSE INVERSE DIFFERENCE MOMENT	1.00000	0.49671 <.0001	-0.30930 <.0001	-0.83099 <.0001	0.04972 0.4845
PEAKTRAN PEAK TRANSITIONAL PROB	0.49671 <.0001	1.00000	-0.28553 <.0001	-0.40493 <.0001	-0.37782 <.0001
TRIANGUL TRIANGULAR SYMMETRY	-0.30930 <.0001	-0.28553 <.0001	1.00000	0.44087 <.0001	-0.03376 0.6350
SECONDDI SECOND DIAG MOMENT	-0.83099 <.0001	-0.40493 <.0001	0.44087 <.0001	1.00000	-0.17091 0.0155
SUMENTRO SUM ENTROPY	0.04972 0.4845	-0.37782 <.0001	-0.03376 0.6350	-0.17091 0.0155	1.00000