

Table S1

Antibodies

Target	Source	Use	Referred to
α -GFP	#11814460001, Roche	WB, IP/WB	Fig. 1, Fig. S1
α -EGFP	Homemade rabbit antibody	ChIP-seq, ChIP-qPCR, IF	Fig. 1, Fig. 2, Fig. 3, Fig. S2, Fig. S3
α -STAG1	Homemade rabbit antibody	One-Day ChIP Kit, Re-ChIP	Fig. 3; Fig. S3
α -STAG1	#A300-156A, Bethyl Laboratories	WB	Fig. 1; Fig. S1; Fig. S12
α -STAG2	Homemade rabbit antibody	One-Day ChIP kit, Re-ChIP	Fig. S3
α -STAG2	#A300-055A, Bethyl Laboratories	WB	Fig. 1; Fig. S1; Fig. S12
α -SMC1A	Niels Galjart	IP/WB	Fig. 1; Fig. S1
α -SMC1A	#A300-055A, Bethyl Laboratories	WB	Fig. S12
α -SMC3	Homemade rabbit antibody	IP, ChIP-qPCR, Re-ChIP	Fig. 1, Fig. 2; Fig. 3; Fig. S1; Fig. S3
Rabbit IgG	#C15410206, Diagenode	One-Day ChIP Kit, Re-ChIP	Fig. 3; Fig. S3
Rabbit IgG	#500-P00-500 μ g, Peprotech	IP, ChIP-qPCR	Fig. 1, Fig. 2, Fig. S1, Fig. S3
α -Tubulin (TUBB)	#T8328, Sigma	WB	Fig. 1, Fig. S1, Fig. S7, Fig. S12
α -SA1	Abcam ab4457	dSTORM	Fig. 3, Fig. S7
α -SA2	Bethyl A302-580A	dSTORM	Fig. 3, Fig. S7
α -CTCF	BD 612148	dSTORM, WB	Fig. 3, Fig. S7
Anti-Topoisomerase II	MAB4197, Merck	WB	Fig. S7

Table S2

ChIP-qPCR primers

Forward (F)		Reverse (R)		Fig:
H19/IGF2_R1-F	TGTGGATAATGCCCGACCTGAAGATCTG	H19/IGF2_R1-R	ACGGAATTGGTTGTAGTTGTGGAATCGGAAGT	Fig.1
H19/IGF2_R2-F	TTCAGCCGGTTCAAGGGACG	H19/IGF2_R2-R	CTAGGGAGGAGGACAGAGGCAAGAG	Fig.1
Neg. Target-F	GCTGCTGTTCCGCCATTCAATTC	Neg. Target-R	GCTGATACCAACCACCAATCCATGAG	Fig.1, 3
PAGE2B/FAM104B locus_R1-F	CCAAGTACTGGTCTTTCAATGT	PAGE2B/FAM104B locus_R1-R	GTCATACAGCAGTGAATGGA	Fig.2, Fig. S3
PAGE2B/FAM104B locus_R2-F	GATGGTTTCTTCTCATTATCTCCA	PAGE2B/FAM104B locus_R2-R	CACCCACTCTGAAAGTGGAT	Fig.2, Fig. S3
PAGE2B/FAM104B locus_R3-F	CACTGTACCTGCAGGTCAT	PAGE2B/FAM104B locus_R3-R	GTCCCCACGGTCATCACGCT	Fig.2, Fig. S3
LY86-AS1/LY86 locus_R1-F	CTCAGTGTCTCTGAGGTACA	LY86-AS1/LY86 locus_R1-R	TCACCTAGCCAGAGGTGTGA	Fig.S3
LY86-AS1/LY86 locus_R2-F	GATTCAGGTCAGGCTTTCCCA	LY86-AS1/LY86 locus_R2-R	CAGAGCTGGCTTCAGGAACA	Fig.S3
LY86-AS1/LY86 locus_R3-F	CCAGCCAGGAGGCCACTA	LY86-AS1/LY86 locus_R3-R	GCAGTTTGATAAGTTGTGTGGAA	Fig.S3
LY86-AS1/LY86 locus_R4-F	GCCACACAGAACTTCAGAA	LY86-AS1/LY86 locus_R4-R	CAGGAAGCGTCCGCAGGA	Fig.S3
LY86-AS1/LY86 locus_R5-F	CCAAGATTGGACCATGTTTGA	LY86-AS1/LY86 locus_R5-R	CAAGAAAGTGGGCTTTGTCTCT	Fig.S3
ICOS locus_R1-F	CTATGGGGCCAGTTCATGATT	ICOS locus_R1-R	TCCCAAGATTCCTTCACTCA	Fig.S3
ICOS locus_R2-F	TATCCAGGCAGACTGAATTG	ICOS locus_R2-R	CCTTTCTAGGGATGGGGTGT	Fig.S3
P1_SA1/SA2-F	TGTGGATAATGCCCGACCTGAAGATCTG	P1_SA1/SA2-R	ACGGAATTGGTTGTAGTTGTGGAATCGGAAGT	Fig.S3
P2_SA1/SA2-F	TTCAGCCGGTTCAAGGGACG	P2_SA1/SA2-R	CTAGGGAGGAGGACAGAGGCAAGAG	Fig.S3
P3_SA1/SA2-F	TGAGTTCCTCTTAGCTCCAA	P3_SA1/SA2-R	TGCATACTGCAGGTGCAAGCA	Fig.S3
P4_SA1/SA2-F	CCAAGTACTGGTCTTTCAATGT	P4_SA1/SA2-R	GTCATACAGCAGTGAATGGA	Fig.S3
P5_SA1/SA2-F	TAGCCGCTGTAAGGAGAA	P5_SA1/SA2-R	GTGCTCTGCTCATCTCTGGA	Fig.S3
P6_SA1/SA2-F	GCCACACAGAACTTCAGAA	P6_SA1/SA2-R	CAGGAAGCGTCCGCAGGA	Fig.S3
P7_SA1/SA2-F	GATTCAGGTCAGGCTTTCCCA	P7_SA1/SA2-R	CAGAGCTGGCTTCAGGAACA	Fig.S3
P8_SA1/SA2-F	GGTCACAATACATACATGGGCTA	P8_SA1/SA2-R	CAGAGCCGAATGTAGGTCATAAA	Fig.S3
P1_SA2-F	AGGTGCCACTGTATGGAAG	P1_SA2-R	CGCCAGCATACTGTAGTGA	Fig.S3
P2_SA2-F	CCCCTGTGACTTCTCACT	P2_SA2-R	TTGAACCTAATGCAATCACTTG	Fig.S3
P3_SA2-F	CACTGTACCTGCAGGTCAT	P3_SA2-R	GTCCCCACGGTCATCACGCT	Fig.S3
P4_SA2-F	TATCCAGGCAGACTGAATTG	P4_SA2-R	CCTTTCTAGGGATGGGGTGT	Fig.S3
P5_SA2-F	AGGAGGGCAGTGAAGCAGT	P5_SA2-R	GCTGTGAGCCTTTCCTGAAG	Fig.S3
P6_SA2-F	CCCCAGAGATGGGTTTTCTG	P6_SA2-R	CTTGCTGTGGGTTTTGT	Fig.S3
P7_SA2-F	TCATCTCCCCAGTTCCTGAC	P7_SA2-R	ACACTCTCATGTCCGCCTTC	Fig.S3
P8_SA2-F	TTGAAAATCGTGCTCAGAA	P8_SA2-R	AATGGCCACACTTGGATGAG	Fig.S3
P1_SA1-F	GGAATGGCTGTTGTAATGTACA	P1_SA1-R	TCTGTGTAATGTGACTTCTCT	Fig.S3
P2_SA1-F	AACTCCAGTTATTACATGAATAGA	P2_SA1-R	AGCATTTTGTGGTCCGAGCA	Fig.S3
P3_SA1-F	GGGAATTGGCACAGGACTT	P3_SA1-R	GGGCTGAGCTAAACCATGTA	Fig.S3
P4_SA1-F	CCAGCCAGGAGGCCACTA	P4_SA1-R	GCAGTTTGATAAGTTGTGTGGAA	Fig.S3
P5_SA1-F	ATGCCTAATGCATAATGTCAGAA	P5_SA1-R	CAGGAGGCGGTAAGAGTCTT	Fig.S3
P6_SA1-F	CTCCAGTGTGTGTCACCA	P6_SA1-R	GAGCTTGGCAGTAGCAGGT	Fig.S3
P7_SA1-F	CAGATAACTGAATGTTCTCCTTA	P7_SA1-R	GTGTACTGCCTGGAGTGGAT	Fig.S3
P8_SA1-F	TCCAGGTTAGTTGGTCGTATG	P8_SA1-R	TGGTTCACGCTGTAATTGA	Fig.S3
ReChIP_neg	GCTGCTGTTCCGCCATTCAATTC	ReChIP_neg	GCTGATACCAACCACCAATCCATGAG	Fig. 3
ReChIP_1_F	AGGCACCTTAGCCAATG	ReChIP_1_R	CTGTATGCGACTCTGTGAC	Fig. 3
ReChIP_2_F	TGATAAGGAACGCTGAAAACAGCCT	ReChIP_2_R	ACAGCTCTTCTGAGAAAGTGCCA	Fig. 3
ReChIP_3_F	CACTGTACCTGCAGGTCAT	ReChIP_3_R	GTCCCCACGGTCATCACGCT	Fig. 3
ReChIP_4_F	TAGCCGCTGTAAGGAGAA	ReChIP_4_R	GTGCTCTGCTCATCTCTGGA	Fig. 3
ReChIP_5_F	GATGGTTTCTTCTCATTATCTCCA	ReChIP_5_R	CACCCACTCTGAAAGTGGAT	Fig. 3
Re_ChIP_6_F	CCAAGTACTGGTCTTTCAATGT	Re_ChIP_6_R	GTCATACAGCAGTGAATGGA	Fig. 3
Re_ChIP_7_F	CTATGGGGCCAGTTCATGATT	Re_ChIP_7_R	TCCCAAGATTCCTTCACTCA	Fig. 3
Re_ChIP_8_F	GGTCACAATACATACATGGGCTA	Re_ChIP_8_R	CAGAGCCGAATGTAGGTCATAAA	Fig. 3
Re_ChIP_9_F	GCCACACAGAACTTCAGAA	Re_ChIP_9_R	CAGGAAGCGTCCGCAGGA	Fig. 3
Re_ChIP_10_F	GATTCAGGTCAGGCTTTCCCA	Re_ChIP_10_R	CAGAGCTGGCTTCAGGAACA	Fig. 3

Table S3

RT-qPCR primers

Forward (F)		Reverse (R)		Referred to:
STC2-F	TACCTCAAGCACGACCTGTG	STC2-R	CCCAGTTCTGCTCACACTGA	Fig. 5
KDM3A-F	CTGGGCCCAAGATGTATAA	KDM3A-R	TCGTCAGAATCTCCATCTTGG	Fig. 5
SNAPIN-F	AGCTCGACTCTCACGTACAC	SNAPIN-R	GCCGGGCATTAAGTAGCTTC	Fig. 5, Fig. 6, Fig. S12
DUSP4-F	CACAGAGCCCTTGACCT	DUSP4-R	CACTGCCGAGGTAGAGGAAG	Fig. 5
BNIP3L-F	GCAGGGACCATAGCTCTCAG	BNIP3L-R	TACCCAGTCCGCACTTTTCT	Fig. 5
FUS-F	GCCTAGCTATGGTGGACAGC	FUS-R	CCACCACCACTACTCATGGA	Fig. 5
CAV1-F	GAGCTGAGCGAGAAGCAAGT	CAV1-R	CAAATGCCGTCAAACCTGTG	Fig. 5
NR4A2-F	GGGCTGCAAAGGCTTCTTTA	NR4A2-R	CGGCAGTACTGACAGCGATT	Fig. 5
TGM2-F	CAACCTGGAGCCTTCTCTG	TGM2-R	CCGTAAGGCAGTCACGGTAT	Fig. 5
AMOTL2-F	GGCAAGCAAGACACAGGAG	AMOTL2-R	CAGCTTCTCTTGCTCCTGCT	Fig. 5
CDK6-F	TCGTGGAAGTTCAGATGTTGA	CDK6-R	CTCAATTGGTTGGGCAGATT	Fig. 6
IL6ST-F	GCCTGTTTGCTTAGCATTCC	IL6ST-R	CAGTGAAATTGCCATCTGAA	Fig. 6
AXL-F	TGGCTGTGAAGACGATGAAG	AXL-R	AGACCGCTTCACTCAGGAAA	Fig. 6
GAL-F	CAGGTCATTCAGCGACAAGA	GAL-R	TGATTGTGCGCATGATATTG	Fig. 6
ADAM19-F	GTAACAACCCCTGCTGCAAT	ADAM19-R	GGAGACTTGCCCGTACAGAA	Fig. 6
STAG1-F	ATGCAGAATGCAGAAATCATCAGA	STAG1-R	TCATCATAAATTATGCTATACTGA	Fig. S12
STAG2-F	TTGCCACCATCAAAGAACAGAC	STAG2-R	TGCACTTGATCTTGGTAAGC	Fig. S12
SMC1A-F	ATCAAGCGCCTTTACCCTGGCT	SMC1A-R	CTGTCTTCTCCGAGTCCACAAT	Fig. S12

Table S4

Differentially expressed genes after STAG1 degradation (FDR < 0,05; log2 FC >0,6)
(Genes annotated in **bold red** are genes that respond to auxin (Rao et al., Cell, 2017))

Gene name	baseMean	log2FoldChange	pvalue	ENS Gene
STC2	1553.04307	0.429846247	3.63534E-05	ENSG00000113739
AC007238.1	238.304234	-0.223850444	0.03946788	ENSG00000231043
AC013248.2	660.858416	-0.232946589	0.035302666	ENSG00000230897
AC015712.2	384.229879	0.488001244	1.32694E-05	ENSG00000259583
AC026366.1	2413.79956	-0.282700822	0.005533248	ENSG00000240342
AC074033.1	253.40146	-0.274798627	0.012235553	ENSG00000213178
AC091167.1	140.066563	-0.205942115	0.040986763	ENSG00000225193
AC136632.1	457.307896	-0.270154174	0.015947765	ENSG00000218227
ADAM19	2129.74826	0.369498689	0.000382867	ENSG00000135074
ADGRF1	120.730402	0.213286137	0.021349738	ENSG00000153292
ADIRF-AS1	228.131195	0.309592231	0.004376332	ENSG00000272734
ADORA2B	1282.01441	0.277295599	0.008307564	ENSG00000170425
AHRR	650.355628	0.676510312	0.000000001	ENSG00000063438
AKAP12	101645.75	0.247627334	0.005230597	ENSG00000131016
AL009174.1	35.5021956	-0.216570546	0.000969204	ENSG00000227008
ALDH1A3	5522.92639	0.720718461	1.68579E-14	ENSG00000184254
ANXA2P2	632.621689	0.22631971	0.005339164	ENSG00000231991
AQP3	281.644987	0.254042966	0.021620495	ENSG00000165272
ARL4D	288.551225	0.226624299	0.039159652	ENSG00000175906
ARSG	260.940284	0.229507993	0.036831332	ENSG00000141337
ATP11A	2243.80931	0.205816791	0.045838606	ENSG00000068650
ATP5J	1763.87771	-0.229295088	0.025785912	ENSG00000154723
ATP9A	1392.45901	0.295727884	0.004933776	ENSG00000054793
BHLHE40	1011.55291	0.269191215	0.012712364	ENSG00000134107
BNIP3L	217.125089	0.291630964	0.00686662	ENSG00000104765
BUB1B	1060.68306	-0.224271385	0.03684633	ENSG00000156970
C1orf116	237.116115	0.253547394	0.020110651	ENSG00000182795
CAPN5	235.076964	0.225168047	0.038939534	ENSG00000149260
CAV1	3774.08524	-0.260436934	0.006888418	ENSG00000105974
CBWD2	134.72796	0.203641035	0.036820121	ENSG00000136682
CCNA2	807.479729	-0.22992282	0.036447375	ENSG00000145386
CD109	3053.91097	0.267953966	0.008764745	ENSG00000156535
CD59	3938.52459	0.194168898	0.041691076	ENSG00000085063
CDCA5	2176.02297	-0.206312446	0.043041166	ENSG00000146670
CDK1	1335.46082	-0.235500243	0.027427664	ENSG00000170312
CDK6	2650.48925	0.302153586	0.003364328	ENSG00000105810
COX7C	2986.04004	-0.240004655	0.013983887	ENSG00000127184
CPA4	9395.53881	0.254305472	0.006808085	ENSG00000128510
CREB3L2	1429.33861	0.21677937	0.037242233	ENSG00000182158
CRY1	255.342622	0.226608196	0.038693403	ENSG00000008405
CRY2	357.077891	0.235191803	0.035536866	ENSG00000121671
CTNNA1	9617.15462	0.221571227	0.015120528	ENSG00000044115
CTNNAL1	1821.80906	-0.223999278	0.028853176	ENSG00000119326
CYP1A1	254.743646	0.923728579	3.52374E-17	ENSG00000140465

CYP1B1	103.303218	0.399898714	1.40768E-05	ENSG00000138061
DAGLB	745.352963	0.226636061	0.039059288	ENSG00000164535
DDX39A	1931.44745	-0.214456134	0.038801073	ENSG00000123136
DHRS3	638.345269	0.291366772	0.008778444	ENSG00000162496
DUSP4	3871.47077	0.326901128	0.000637067	ENSG00000120875
EEF1A1	21324.5176	0.240528981	0.008221504	ENSG00000156508
EGFR	2811.33006	0.24131266	0.016826998	ENSG00000146648
EREG	6478.90214	0.283980333	0.002192839	ENSG00000124882
ERRFI1	10561.4611	0.214644763	0.022594264	ENSG00000116285
ESPL1	959.217933	-0.234742213	0.029695875	ENSG00000135476
EXOSC9	1506.97899	-0.21540063	0.037526859	ENSG00000123737
FANCG	1139.51958	-0.225326265	0.0370216	ENSG00000221829
FGF9	152.1991	0.28080702	0.00473005	ENSG00000102678
FUCA1	727.491446	0.331438148	0.00270783	ENSG00000179163
FUS	6839.05855	-0.325230148	0.000470144	ENSG00000089280
GAL	939.272138	-0.231878265	0.031874768	ENSG00000069482
GALNT5	3457.58473	0.277505524	0.006203653	ENSG00000136542
GAPDHP65	1026.85298	-0.228233955	0.033629145	ENSG00000235587
GDA	1632.64285	0.453899985	0.000015009	ENSG00000119125
GDF15	6593.3238	0.474156977	3.53918E-07	ENSG00000130513
GLI2	320.286431	0.239688862	0.029756323	ENSG00000074047
GNG12	1305.50407	0.208833409	0.049899282	ENSG00000172380
GPRC5A	14470.1639	0.365431032	6.65725E-05	ENSG00000013588
H1FO	7472.14175	0.279836254	0.002932592	ENSG00000189060
HAS3	2656.83242	0.908781683	2.6989E-20	ENSG00000103044
HBE1	1072.38293	0.244966296	0.022016039	ENSG00000213931
HECW2	137.684504	0.200967766	0.045804615	ENSG00000138411
HIPK2	2734.67007	0.358507202	0.00026019	ENSG00000064393
HMGB1	1479.49622	-0.232494592	0.025781286	ENSG00000189403
HNRNPD	5092.84814	-0.207774607	0.028469751	ENSG00000138668
HPCAL1	1969.60217	0.442399889	1.42505E-05	ENSG00000115756
HSPB1	3767.12015	-0.219196259	0.022266624	ENSG00000106211
IRF2BPL	1436.32805	0.2556335	0.014416818	ENSG00000119669
ITGB5	1794.47167	0.222310303	0.029623772	ENSG00000082781
ITPR1	231.734143	0.220305252	0.042875571	ENSG00000150995
KHNYN	1328.74673	0.209633771	0.045917647	ENSG00000100441
KIAA1683	229.589509	0.285833318	0.008592335	ENSG00000130518
KNTC1	1006.85372	-0.250433006	0.020692262	ENSG00000184445
KRT15	917.824711	0.256939684	0.018128166	ENSG00000171346
LAMC2	1240.74127	0.262490347	0.012909499	ENSG00000058085
LDHAP5	299.224978	-0.220346573	0.046475284	ENSG00000213574
LGALS3	1606.14482	0.464059179	6.86372E-06	ENSG00000131981
LIMA1	3038.72204	0.211729378	0.029455826	ENSG00000050405
LINC00511	596.648032	0.280642856	0.011624763	ENSG00000227036
LMF2	981.906922	-0.229311586	0.035153695	ENSG00000100258
LPP	1197.9245	0.26713684	0.012377485	ENSG00000145012
LTK	382.19436	0.231620684	0.037381964	ENSG00000062524
MCM2	3691.6045	-0.201265429	0.03694286	ENSG00000073111
MCM3	6174.61263	-0.185315573	0.049846859	ENSG00000112118
MCM4	5619.3297	-0.198772422	0.03301273	ENSG00000104738

MED13L	5225.65175	0.194441332	0.038337255	ENSG00000123066
MID1	3195.83089	0.397453862	4.62584E-05	ENSG00000101871
MLPH	1927.1131	0.232293767	0.023922346	ENSG00000115648
MT1G	313.839859	0.231708339	0.037280636	ENSG00000125144
MT2A	4596.17198	0.324540696	0.000594269	ENSG00000125148
MTCO3P12	15720.2806	0.24389268	0.006421804	ENSG00000198744
MTUS1	1688.05962	0.228135481	0.026881805	ENSG00000129422
MYEOV	3455.03849	0.224217226	0.022122473	ENSG00000172927
MYOF	14243.616	0.201045953	0.027357519	ENSG00000138119
NCAPG2	1490.01692	-0.207076745	0.045682108	ENSG00000146918
NDRG1	2969.30105	0.324724545	0.000860687	ENSG00000104419
NGFR	325.583342	0.269895422	0.015441168	ENSG00000064300
NPAS2	544.062208	0.265718547	0.017699227	ENSG00000170485
NPTN	946.354944	0.214123093	0.047487458	ENSG00000156642
NQO1	5373.86721	0.405755776	1.47446E-05	ENSG00000181019
NUP85	2349.83045	-0.214895386	0.032791494	ENSG00000125450
NUSAP1	1374.80358	-0.209239124	0.04660435	ENSG00000137804
OR51B4	448.657817	0.308182647	0.005981971	ENSG00000183251
OSGIN1	634.817481	0.254190389	0.022510548	ENSG00000140961
OTUB2	368.217379	0.392204231	0.000454653	ENSG00000089723
PAM	3606.50061	0.21638714	0.024117499	ENSG00000145730
PCLAF	559.871692	-0.22104183	0.047662877	ENSG00000166803
PDLIM5	2830.15734	0.195829374	0.045259246	ENSG00000163110
PER2	163.218515	0.261224339	0.011464355	ENSG00000132326
PNN	4450.05548	-0.202040971	0.033390779	ENSG00000100941
POLE	3394.58564	-0.197166136	0.045192495	ENSG00000177084
PPIAP29	75.9083929	-0.485157062	0.000000007	ENSG00000214975
RABGGTB	2013.42251	-0.216703188	0.03192614	ENSG00000137955
RANBP1	1852.04814	-0.255038216	0.012023616	ENSG00000099901
RNF128	168.584917	0.239852253	0.021259165	ENSG00000133135
RPL34	4460.86115	-0.201320036	0.035633711	ENSG00000109475
RPL5P4	42.4816015	-0.227343704	0.00065862	ENSG00000229994
RPS23	4019.23236	-0.227336628	0.023767614	ENSG00000186468
RPS27AP16	3534.72097	-0.231096045	0.019727652	ENSG00000224631
RPS29	4474.3423	-0.259061353	0.008158282	ENSG00000213741
RPS6KA2	226.295931	0.304341601	0.003667454	ENSG00000071242
RPSA	4154.11797	-0.277403214	0.003734191	
RRM1	2456.79125	-0.284560695	0.004156358	ENSG00000167325
SECTM1	529.907198	0.369123808	0.000955381	ENSG00000141574
SH3BP4	1568.61242	0.24950967	0.018066042	ENSG00000130147
SH3KBP1	1813.24675	0.213684426	0.038497203	ENSG00000147010
SLC16A6	121.126739	0.201147792	0.03997311	ENSG00000108932
SLC2A1	6167.59549	0.294675487	0.001584407	ENSG00000117394
SLC37A2	77.0629637	0.219361769	0.011711534	ENSG00000134955
SLC39A11	726.747305	0.226651691	0.040595181	ENSG00000133195
SLC3A2	8249.46266	0.310292274	0.000805144	ENSG00000168003
SLC7A5	13624.4039	0.323735834	0.000334664	ENSG00000103257
SMAD3	2625.60913	0.345543981	0.000506292	ENSG00000166949
SMIM14	257.261789	0.215990339	0.049473011	ENSG00000163683
SNHG1	5387.94725	-0.199260323	0.033787959	ENSG00000255717

SNHG25	150.436777	-0.217940219	0.031762084	ENSG00000266402
SNHG9	534.118578	-0.227590459	0.042317473	ENSG00000255198
SNRPG	605.311887	-0.220747636	0.047073183	ENSG00000143977
SOX9	2149.535	0.250003085	0.014875191	ENSG00000125398
SRSF1	5638.93868	-0.19119989	0.041665942	ENSG00000136450
SSH1	4842.92711	0.306130273	0.001194932	ENSG00000084112
SUMO1P3	62.8002729	-0.21484975	0.003179657	ENSG00000235082
TEF	236.536659	0.305396122	0.004993677	ENSG00000167074
TGFA	1743.24663	0.239667746	0.018916938	ENSG00000163235
THOC3	355.803421	-0.248067427	0.026585883	ENSG00000051596
TIMM23B	27.9068186	-0.145820157	0.013440218	ENSG00000204152
TIPARP	864.015609	0.505235741	4.89519E-06	ENSG00000163659
TLDC1	1287.93974	0.31058647	0.003163448	ENSG00000140950
TMEM2	909.943339	0.217213992	0.045012772	ENSG00000135048
TMEM200A	428.63253	0.260951785	0.01995854	ENSG00000164484
TMEM221	75.4495689	0.176376876	0.041593652	ENSG00000188051
TOMM40	2880.31969	-0.204492532	0.037347492	ENSG00000130204
TPM2	7085.40699	-0.212072887	0.024327693	ENSG00000198467
TRIM2	665.133329	0.341136626	0.002064531	ENSG00000109654
TRIOBP	808.807088	0.219404386	0.044688258	ENSG00000100106
TSC22D1	6699.60893	0.35883103	0.000324115	ENSG00000102804
TSPAN18	339.119595	0.21846273	0.046744187	ENSG00000157570
TUBA1B	2116.57294	-0.239828003	0.01837716	ENSG00000123416
TUBA1C	1542.3865	-0.203094852	0.049369336	ENSG00000167553
TYMS	1427.83029	-0.231660138	0.026673775	ENSG00000176890
UBE2C	926.394729	-0.248847799	0.022068283	ENSG00000175063
UNC13A	3245.49718	0.194700436	0.0442065	ENSG00000130477
USP39	1923.84998	-0.218147507	0.031100452	ENSG00000168883
WDR34	1471.11155	-0.22324974	0.034859573	ENSG00000119333
WNT16	475.172545	0.290349912	0.009566714	ENSG00000002745
WNT9A	672.65464	0.260004	0.018641762	ENSG00000143816
ZFP36L1	2953.26356	0.296502364	0.002346183	ENSG00000185650
ZWINT	1913.28877	-0.245259449	0.015680565	ENSG00000122952

Table S5

Differentially expressed genes after STAG2 degradation (FDR < 0,05; log2 FC >0,6)(Genes annotated in **bold red** are genes that respond to auxin (Rao et al., Cell, 2017))

Gene name	baseMean	log2FoldChange	pvalue	ENS Gene
AC015712.2	384.8367021	0.343536448	0.003846459	ENSG00000259583
AC026254.2	122.2613771	0.501084233	1.38642E-06	ENSG00000239223
AC040162.1	76.25874216	-0.186694117	0.045375069	ENSG00000132382
AC073621.1	3563.864194	-0.234192151	0.029087202	ENSG00000178896
AC106795.1	85.64286778	-0.244098067	0.012887103	ENSG00000183087
ACTN4	12024.8453	-0.226798952	0.027817609	ENSG00000013375
ADD3	663.1215888	0.27080804	0.021368274	ENSG00000067167
AGRN	2281.53145	-0.237771088	0.040266694	ENSG00000164362
AHRR	411.5171477	0.613320808	0.00000025	ENSG00000063438
AL049714.1	43.27995222	0.277092103	0.000243308	ENSG00000115548
AL109741.2	28.09865026	-0.156925872	0.021503845	ENSG00000150961
AL358472.1	15.89799953	0.11332353	0.032748936	ENSG00000110047
ALDH1A3	4487.604962	0.372165531	0.000787307	ENSG00000184254
ALYREF	2637.710198	-0.223946285	0.046348333	ENSG00000099624
AMOTL2	1290.77886	-0.380629925	0.001156461	ENSG00000187961
ANKRD12	279.3924239	0.273362385	0.018955028	ENSG00000099795
AQP3	204.3853501	0.2734884	0.014623327	ENSG00000165272
ARHGEF37	332.5581374	0.304375561	0.010230253	ENSG00000114019
ASPSR1	728.5663998	-0.238282752	0.043706312	ENSG00000025770
ATAD3B	1207.909712	-0.247737829	0.031501388	ENSG00000188157
ATP5D	1232.25509	-0.258024608	0.028864409	ENSG00000198380
AURKAIP1	1479.549143	-0.226988725	0.047635975	ENSG00000127586
AURKB	748.1378103	-0.278142864	0.018907323	ENSG00000130702
AXL	1925.996356	-0.259044996	0.020607361	ENSG00000176018
CADPS2	267.1602114	0.28054561	0.016340993	ENSG00000063660
CAPN15	646.0101997	-0.235655075	0.047522829	ENSG00000231416
CAV1	4663.658632	-0.280171021	0.008840816	ENSG00000105974
CAVIN1	5760.066965	-0.264975019	0.014541408	ENSG00000034152
CCDC186	612.6470283	0.262164935	0.026457333	ENSG00000155304
CD109	3137.602527	0.341677968	0.002433663	ENSG00000156535
CDK6	3741.178881	0.226896153	0.033585778	ENSG00000105810
CEP170B	2421.745841	-0.235735064	0.040818566	ENSG00000142627
CGN	706.0781858	-0.270723202	0.022196092	ENSG00000125912
CHTF18	1103.064818	-0.25381691	0.029802969	ENSG00000144369
CKB	6217.640042	-0.216102872	0.043918714	ENSG00000186472
CLUH	4172.653194	-0.264729579	0.016553663	ENSG00000166165
COL18A1	1141.378117	-0.233037828	0.04801685	ENSG00000204634
COL9A3	854.5258926	-0.277186141	0.017783767	ENSG00000183684
CREBRF	111.1846609	0.210218014	0.044523028	ENSG00000087077
CYC1	4047.304583	-0.233313079	0.028975619	ENSG00000196878
CYP1A1	207.8273184	0.650896061	1.4891E-08	ENSG00000140465
CYP1B1	135.8637742	0.426014603	8.67938E-05	ENSG00000138061
DDX51	982.8234669	-0.27168034	0.018891634	ENSG00000071794
DHRS3	489.7517385	0.275410525	0.020394665	ENSG00000162496

DISP1	215.6501615	0.230447702	0.04592773	ENSG00000140451
DPP7	2305.715134	-0.239246214	0.035816302	ENSG00000186480
DUS3L	610.2479378	-0.259084161	0.028564112	ENSG00000118515
EBNA1BP2	2612.082088	-0.224574619	0.038584023	ENSG00000179091
EEF1D	6776.457067	-0.243473236	0.025370621	ENSG00000112144
EGFR	2044.138496	0.250170814	0.023118884	ENSG00000146648
EGR1	2945.432344	0.256977408	0.019345745	ENSG00000006459
EHD1	1066.519573	-0.266773626	0.023215396	ENSG00000164463
EPHA2	5812.818836	-0.22277592	0.033675944	ENSG00000130402
EXOSC4	750.0340241	-0.252137566	0.032286558	ENSG00000162006
F3	1074.564505	-0.294334615	0.010257585	ENSG00000184990
FAM102B	301.0361861	0.287378005	0.0150974	ENSG00000106366
FAM171B	383.5676569	0.24258572	0.041435565	ENSG00000132361
FGF9	204.9016955	0.287919095	0.012124657	ENSG00000102678
FGF9	980.5573876	0.294500898	0.010600599	ENSG00000179163
FGFBP1	98.86684065	0.201133171	0.048073726	ENSG00000183751
FLNC	5341.900359	-0.310100082	0.004829358	ENSG00000137440
FOS	2082.444442	0.401701411	0.000419404	ENSG00000153234
GAL	788.2632445	-0.268459136	0.021611255	ENSG00000069482
GAS6	1097.599255	-0.245019481	0.037790506	ENSG00000138593
GDA	1927.082242	0.45294776	4.22538E-05	ENSG00000119125
GDF15	6345.725409	0.219630837	0.039037869	ENSG00000130513
GFPT1	1750.15019	0.227677668	0.041725319	ENSG00000228399
GJB3	716.7578616	-0.277188612	0.019634363	ENSG00000086544
GPC1	2261.663728	-0.289576574	0.008359392	ENSG00000175756
GULP1	671.7906819	0.256602572	0.02927724	ENSG00000177469
H1FO	5305.533346	0.242777375	0.025572273	ENSG00000189060
H2AFX	1239.53394	-0.236993874	0.041817481	ENSG00000127666
HAS3	1112.561461	0.515914842	8.25834E-06	ENSG00000103044
HAT1	1012.52403	0.269161528	0.02013686	ENSG00000177700
HIPK2	1882.110089	0.253191977	0.023429218	ENSG00000064393
HLTF	981.9837767	0.231061377	0.045918587	ENSG00000128708
HPCAL1	1088.530876	0.252071067	0.028906441	ENSG00000115756
HSPA13	715.5878159	0.288654747	0.014045111	ENSG00000175793
ICK	295.1385933	0.246247733	0.037120649	ENSG00000135480
IDH1	1200.981012	0.228791114	0.044380748	ENSG00000167601
IL6ST	477.3367111	0.314802296	0.008140836	ENSG00000244535
INF2	1492.338932	-0.238688038	0.03862448	ENSG00000176978
INSIG1	728.3856007	0.245477444	0.036286497	ENSG00000165684
INTS8	962.2908645	0.238296553	0.041197772	ENSG00000196756
ISYNA1	2709.390161	-0.217193478	0.048261711	ENSG00000167755
ITPKC	538.341544	-0.2368878	0.046388887	ENSG00000128626
ITPR1	324.2172668	0.30954599	0.009016786	ENSG00000150995
ITPR2	345.9874576	0.276300912	0.019854484	ENSG00000117525
KDM3A	1034.265164	0.299562994	0.009732671	ENSG00000198918
KDM7A	452.5775543	0.291407766	0.01423637	ENSG00000152558
KIAA1683	176.1416106	0.262822415	0.020026857	ENSG00000130518
KLHL17	1082.713	-0.230375834	0.048685769	ENSG00000166166
KLK6	673.1270016	-0.263709391	0.025402083	ENSG00000169696
KRT7	289.5259415	-0.280506998	0.015448656	ENSG00000177707

KRT8	38619.73064	-0.216112054	0.040117001	ENSG00000109680
LAMA5	6063.177906	-0.209582077	0.046868698	ENSG00000070814
LAMB3	2022.157194	-0.236393924	0.032095645	ENSG00000114767
LGALS3	1149.289095	0.238376356	0.038969489	ENSG00000131981
LINC00511	593.406884	0.249583433	0.03522631	ENSG00000227036
LPP	1315.656376	0.254391796	0.024673182	ENSG00000145012
LYSMD3	353.8116475	0.240631739	0.042833246	ENSG00000006062
MAN2A1	827.493203	0.261093879	0.026215756	ENSG00000125731
MAP2K3	2742.910921	-0.227234177	0.04415226	ENSG00000169750
MAP3K14	366.7247578	-0.280866518	0.017959409	ENSG00000099994
MID1	3453.768669	0.260377991	0.016585339	ENSG00000101871
MRPL45P2	171.8077608	-0.27296757	0.014219748	ENSG00000154309
MRPS12	1444.475199	-0.245245492	0.033917484	ENSG00000117395
MSLNL	122.3519433	-0.216989116	0.041262123	ENSG00000104529
MYBBP1A	2937.990729	-0.247572379	0.024626946	ENSG00000170421
MYOF	15526.78597	0.305241035	0.003946188	ENSG00000138119
NCAPD2	3273.818249	-0.225217483	0.03766847	ENSG00000215030
NCAPH2	1149.808233	-0.246719737	0.035197268	ENSG00000160551
NCLN	2895.799697	-0.226353639	0.045575982	ENSG00000144366
NCOA7	254.7815986	0.232012485	0.046950973	ENSG00000123104
NDRG1	3413.449341	0.238381116	0.027756228	ENSG00000104419
NDUFB7	862.7152708	-0.297873643	0.010896228	ENSG00000168268
NECTIN3	2423.464888	0.216455261	0.047070608	ENSG00000143375
NQO1	12579.85348	0.413677653	5.88011E-05	ENSG00000181019
NR1D2	819.7187178	0.260829779	0.026441788	ENSG00000228782
NR4A2	1977.967525	0.438077753	0.000117802	ENSG00000198959
NT5DC2	2015.58192	-0.218213362	0.047792317	ENSG00000112893
OR51B4	531.1102715	0.310343401	0.008919742	ENSG00000183251
PCLO	296.3343675	0.263676181	0.02527627	ENSG00000230837
PER2	156.1994998	0.230160941	0.038591881	ENSG00000132326
PGM3	1014.781984	0.25283608	0.029655782	ENSG00000162636
PIDD1	1080.740111	-0.310881331	0.008269146	ENSG00000105655
PIF1	252.3583	-0.266261395	0.020524855	ENSG00000138413
PJA2	993.1522887	0.267140243	0.021774063	ENSG00000170089
POLR2L	1961.234912	-0.286968381	0.01221301	ENSG00000111961
PTPN12	1412.660759	0.283475013	0.012992089	ENSG00000177595
PTPN23	1226.787425	-0.247758442	0.029906623	ENSG00000099814
RAC3	1656.880499	-0.248901749	0.030420278	ENSG00000197747
RBM14	1727.665015	-0.222285957	0.047258258	ENSG00000165813
RHOT2	1005.553894	-0.231050831	0.048861633	ENSG00000160072
RPL31P2	334.2277484	0.292607259	0.013579113	ENSG00000128591
RPL39	746.4029417	0.267099558	0.002959655	ENSG00000127947
RRP9	1254.078217	-0.244004533	0.033683822	ENSG00000010292
S100A10	2877.881437	-0.220834091	0.041095855	ENSG00000174738
SASH1	396.5967944	0.235952815	0.047307752	ENSG00000178999
SAT1	2914.622724	0.218978105	0.043373425	ENSG00000151229
SCRIB	3168.339067	-0.280010073	0.013272722	ENSG00000111912
SEC24D	1025.079561	0.263857273	0.023441518	ENSG00000180900
SECISBP2L	912.3232579	0.24173657	0.03818116	ENSG00000092758
SERPINE1	1480.843364	-0.2997523	0.007840159	ENSG00000182871

SESN3	123.0361905	0.221517343	0.03664887	ENSG00000198961
SFN	9214.206238	-0.28127354	0.007010089	ENSG00000239306
SGK1	234.7396969	0.233243332	0.043221827	ENSG00000120738
SH2D3A	1053.416342	-0.288006267	0.01417384	ENSG00000103326
SIVA1	1159.492457	-0.230004723	0.047783612	ENSG00000106688
SLC1A1	178.5993237	0.237069543	0.030704792	ENSG00000185163
SLC2A13	113.6254193	0.237956624	0.021975258	ENSG00000176014
SLC3A2	9305.865437	0.238024255	0.02207227	ENSG00000168003
SMCHD1	1509.041118	0.276336347	0.018860998	ENSG00000183111
SNAPC4	1294.6233	-0.275097406	0.015865243	ENSG00000116266
SNHG17	1099.592109	-0.270046867	0.01837095	ENSG00000261884
STXBP3	477.716723	0.237319308	0.04601972	ENSG00000101596
SUSD2	222.2641519	-0.227153705	0.047190006	ENSG00000076201
TAOK1	2301.836082	0.232506087	0.0400913	ENSG00000188910
TBC1D19	99.03038513	0.227758958	0.025353386	ENSG00000148700
TBC1D8	1122.634323	0.24498009	0.032083011	ENSG00000081803
TBL3	1213.473172	-0.262769071	0.023033875	ENSG00000169764
TCOF1	3392.883745	-0.243251119	0.02499493	ENSG00000149212
TERT	240.4919471	-0.245402926	0.034894581	ENSG00000203485
TGM2	1809.073465	-0.453533862	7.00679E-05	ENSG00000140983
TICAM1	669.0536322	-0.249960408	0.034604723	ENSG00000164941
TIPARP	957.0454751	0.429603366	0.000219342	ENSG00000163659
TMEM123	1984.87583	0.309688406	0.00524705	ENSG00000170345
TOMM40	2500.045643	-0.239441188	0.031464074	ENSG00000130204
TPM2	6939.431946	-0.245223449	0.024744808	ENSG00000198467
TRAM1	1878.899316	0.285449218	0.011926022	ENSG00000134352
TRIM2	968.8913394	0.486572969	2.84237E-05	ENSG00000109654
TRIP6	2179.832996	-0.258026511	0.022953363	ENSG00000188486
TRMT61A	596.5524084	-0.256795292	0.030794077	ENSG00000188229
TSC22D1	4217.883338	0.244379772	0.025030908	ENSG00000102804
TUBB4B	7007.135157	-0.223535862	0.04149241	ENSG00000141994
TUBB6	2399.494472	-0.263347078	0.018488506	ENSG00000130066
UBE2C	1080.816529	-0.303345574	0.009324256	ENSG00000175063
UGP2	920.1915504	0.233723922	0.043330412	ENSG00000101745

Table S6 Sequencing data information and statistics

Hi-C

Cells	Treatment	Dataset	Sequenced Read			Alignable (Normal+Chimeric)		Library Complexity			Short Range		
			Pairs	Normal Paired	Unmapped	Paired	Unique Reads	Estimate	Intra-fragment Reads	Inter-chromosomal	Intra-chromosomal	<20Kb	Long Range (>20Kb)
STAG1_AID	auxin	stag1_aux_rep1	352,994,678	322,385,709(91.33%)	13,955,867(3.95%)	336,688,713(95.38%)	164,271,072(46.54%)	207,871,658	17,860,572(5.06%)	9,536,751(5.81%)	100,480,463(61.17%)	68,057,666(41.43%)	32,422,769(19.74%)
STAG1_AID	auxin	stag1_aux_rep2	215,759,247	196,841,455(91.23%)	6,834,689(3.17%)	207,256,497(96.06%)	109,571,715(50.78%)	149,913,627	16,586,886(7.69%)	6,794,151(6.20%)	63,715,203(58.15%)	43,417,875(39.63%)	20,297,309(18.52%)
STAG1_AID	no auxin	stag1_noaux_rep1	363,651,225	333,836,040(91.80%)	8,807,329(2.42%)	352,094,713(96.82%)	174,183,400(47.90%)	222,500,495	19,280,520(5.30%)	11,245,633(6.46%)	106,628,783(61.22%)	71,549,517(41.08%)	35,079,249(20.14%)
STAG1_AID	no auxin	stag1_noaux_rep2	380,260,326	348,097,881(91.54%)	11,585,821(3.05%)	365,808,354(96.20%)	155,783,014(40.97%)	183,483,536	22,743,860(5.98%)	9,864,411(6.33%)	87,993,350(56.48%)	59,146,464(37.97%)	28,846,856(18.52%)
STAG2_AID	auxin	stag2_aux_rep1	378,077,127	344,605,760(91.15%)	6,368,203(1.68%)	368,228,345(97.40%)	205,334,680(54.31%)	284,878,723	18,069,417(4.78%)	11,924,177(5.81%)	132,780,473(64.67%)	78,537,903(38.25%)	54,242,544(26.42%)
STAG2_AID	auxin	stag2_aux_rep2	385,014,233	355,012,350(92.21%)	8,912,766(2.31%)	373,400,409(96.98%)	127,096,003(33.01%)	137,472,572	18,162,705(4.72%)	6,367,264(5.01%)	71,820,988(56.51%)	47,690,173(37.52%)	24,130,803(18.99%)
STAG2_AID	no auxin	stag2_noaux_rep1	380,231,188	345,070,798(90.75%)	7,914,191(2.08%)	368,760,699(96.98%)	211,005,691(55.49%)	300,668,566	17,309,360(4.55%)	12,363,478(5.86%)	137,362,490(65.10%)	77,541,310(36.75%)	59,821,156(28.35%)
STAG2_AID	no auxin	stag2_noaux_rep2	389,138,689	358,436,903(92.11%)	8,628,365(2.22%)	377,683,900(97.06%)	119,566,816(30.73%)	127,034,528	15,366,801(3.95%)	5,689,490(4.76%)	68,355,153(57.17%)	46,097,311(38.55%)	22,257,823(18.62%)

CHIP-seq

Cells	Antibody	Sample	Merged files	Total Reads	Mapped Reads
STAG1_AID	EGFP	I17-1418-05-SA1-AID_127_EGFP_rep1	SA1-	27008128	20922666
STAG1_AID	EGFP	I18-1093-02-SA1-AID_127_EGFP_rep2	AID_127_EGFP_mrg		
STAG1_AID		I17-1418-04-SA1-AID_127_input		6610798	5330750
STAG2_AID	EGFP	I17-1418-02-SA2-AID_3B9_5_EGFP_rep1	SA2-	25856287	19917173
STAG2_AID	EGFP	I18-1093-05-SA2-AID_3B9_5_EGFP_rep2	AID_3B9_5_EGFP_mrg		
STAG2_AID		I17-1418-01-SA2-AID_3B9_5_input		9142350	7158571

RNA-seq

Cells	Treatment	Sample	Total Reads	Mapped Reads
STAG1_AID	no auxin	I17-1387-08-SA1-AID_69_noaux	28069691	27425144
STAG1_AID	auxin	I17-1387-07-SA1-AID_69_aux	28740294	28133107
STAG1_AID	no auxin	I17-1394-02-SA1-AID_130_noaux	30126480	29384142
STAG1_AID	auxin	I17-1394-01-SA1-AID_130_aux	26577796	25993987
STAG2_AID	no auxin	I17-1387-02-SA2-AID_3B9_5_noaux	31992932	31309222
STAG2_AID	auxin	I17-1387-01-SA2-AID_3B9_5_aux	28202355	27565400
STAG2_AID	no auxin	I17-1387-04-SA2-AID_3B9_3_noaux	26269941	25688596
STAG2_AID	auxin	I17-1387-03-SA2-AID_3B9_3_aux.	28685801	28053320

Table S7

Peak statistics

Feature		Characteristics			Distribution of peaks (%)		
					Common peaks	SA1-only peaks	SA2-only peaks
Promoter	active	TSS	H3K4me3	H3K27Ac	9.5	8.0	32.6
	inactive	TSS	H3K4me3		0.3	0.2	7.0
Enhancer	active	no promoter	H3K4me1	H3K27Ac	15.4	14.9	12.1
	inactive	no promoter	H3K4me1		10.7	9.2	6.9
Others					64.1	67.7	41.4

Table S8**Published datasets used in this study**

Data Type	Reference	Website
RAD21 ChIP-seq	Rao et al., 2017	https://www.ncbi.nlm.nih.gov/geo/query/acc.cgi?acc=GSM2809609
CTCF ChIP-seq	Rao et al., 2017	https://www.ncbi.nlm.nih.gov/geo/query/acc.cgi?acc=GSM2809615
Input ChIP-seq for RAD21 and CTCF	Rao et al., 2017	https://www.ncbi.nlm.nih.gov/geo/query/acc.cgi?acc=GSM3242976
USF1 ChIP-seq	Davis CA et al., 2018	https://www.encodeproject.org/experiments/ENCSR000BVK/
FOSL1 ChIP-seq	Davis CA et al., 2018	https://www.encodeproject.org/experiments/ENCSR000BTE/
CEBPB ChIP-seq	Davis CA et al., 2018	https://www.encodeproject.org/experiments/ENCSR000BSD/
Input ChIP-seq for USF1, FOSL1 and CEBPB	Davis CA et al., 2018	https://www.encodeproject.org/experiments/ENCSR000BMK/
TCF7L2 ChIP-seq	Davis CA et al., 2018	https://www.encodeproject.org/experiments/ENCSR000EUV/
Input ChIP-seq for TCF7L2	Davis CA et al., 2018	https://www.encodeproject.org/experiments/ENCSR000EUX/
H2A.Z ChIP-seq	Davis CA et al., 2018	https://www.encodeproject.org/experiments/ENCSR227XNT/
H3K4me1 ChIP-seq	Davis CA et al., 2018	https://www.encodeproject.org/experiments/ENCSR161MXP/
Input ChIP-seq for H2A.Z and HeK4me1	Davis CA et al., 2018	https://www.encodeproject.org/experiments/ENCSR198WIH/
H3K4me3 ChIP-seq	Davis CA et al., 2018	https://www.encodeproject.org/experiments/ENCSR000DTQ/
Input ChIP-seq for H3K4me3	Davis CA et al., 2018	https://www.encodeproject.org/experiments/ENCSR000DTP/
STAG1 MCF10A ChIP-seq	Kojic et al.,2018	https://www.ncbi.nlm.nih.gov/geo/query/acc.cgi?acc=GSM2718667
STAG2 MCF10A ChIP-seq	Kojic et al.,2018	https://www.ncbi.nlm.nih.gov/geo/query/acc.cgi?acc=GSM2718668
Input MCF10A ChIP-seq	Kojic et al.,2018	https://www.ncbi.nlm.nih.gov/geo/query/acc.cgi?acc=GSM2718671

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Rao SSP, Huang SC, Glenn St Hilaire B, Engreitz JM et al.
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Nucleic Acids Res 2018. Jan 4;46(D1):D794-D801. PMID: 29126249

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Nat Struct Mol Biol 2018 Jun;25(6):496-504. PMID: 29867216

Table S9**Published Softwares**

Software	Reference	Website
BEDTools v2.27	Quinland and Hall, 2010	https://github.com/arq5x/bedtools2/releases
Bowtie	Langmead et al., 2009	http://bowtie-bio.sourceforge.net/index.shtml
deepTools v3.1.3	Ramírez et al., 2014	https://github.com/deeptools/deepTools/blob/develop/docs/content/about.rst
DESeq2	Love et al., 2014	http://bioconductor.org/packages/release/bioc/html/DESeq2.html
Fit-Hi-C v2.0.7	Ay et al., 2014	https://github.com/ay-lab/fithic
TADtool v.0.81	Kruse et al. 2016	https://github.com/vaquerizaslab/tadtool
Juicebox	Durand et al., 2016b	https://github.com/theaidenlab/juicer/wiki
JUICER	Durand et al., 2016a	https://github.com/theaidenlab/juicer/wiki
MACS2.0	Liu, 2014	https://github.com/taoliu/MACS
Python v2.7.15rc1	Python Core Team., 2018	https://www.python.org/
R v3.4.4	R Core Team., 2018	https://www.r-project.org/
RGT v0.12.1	Gusmao et al., 2016; Lin Q et al., 2015	https://pypi.org/project/RGT/
STAR	Dobin et al., 2013	https://github.com/alexdobin/STAR

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Ay F et al. (2014) Statistical confidence estimation for Hi-C data reveals regulatory chromatin contacts. *Genome Research*. 24(6):999-1011.

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Liu, 2014

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Love et al., 2014

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Python Core Team (2018). Python: A dynamic, open source programming language. Python Software Foundation.

Quinland and Hall, 2010

Quinland AR and Hall IM. (2010) BEDTools: a flexible suite of utilities for comparing genomic features. *Bioinformatics*, 26(6):841-842

R Core Team, 2018

R Core Team (2018). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria.

Ramirez et al, 2014

Ramirez F et al. (2014). deepTools: a flexible platform for exploring deep-sequencing data. *Nucleic Acids Res* 42: W187-191.