

Supplementary Figures 1-3

Figure S1

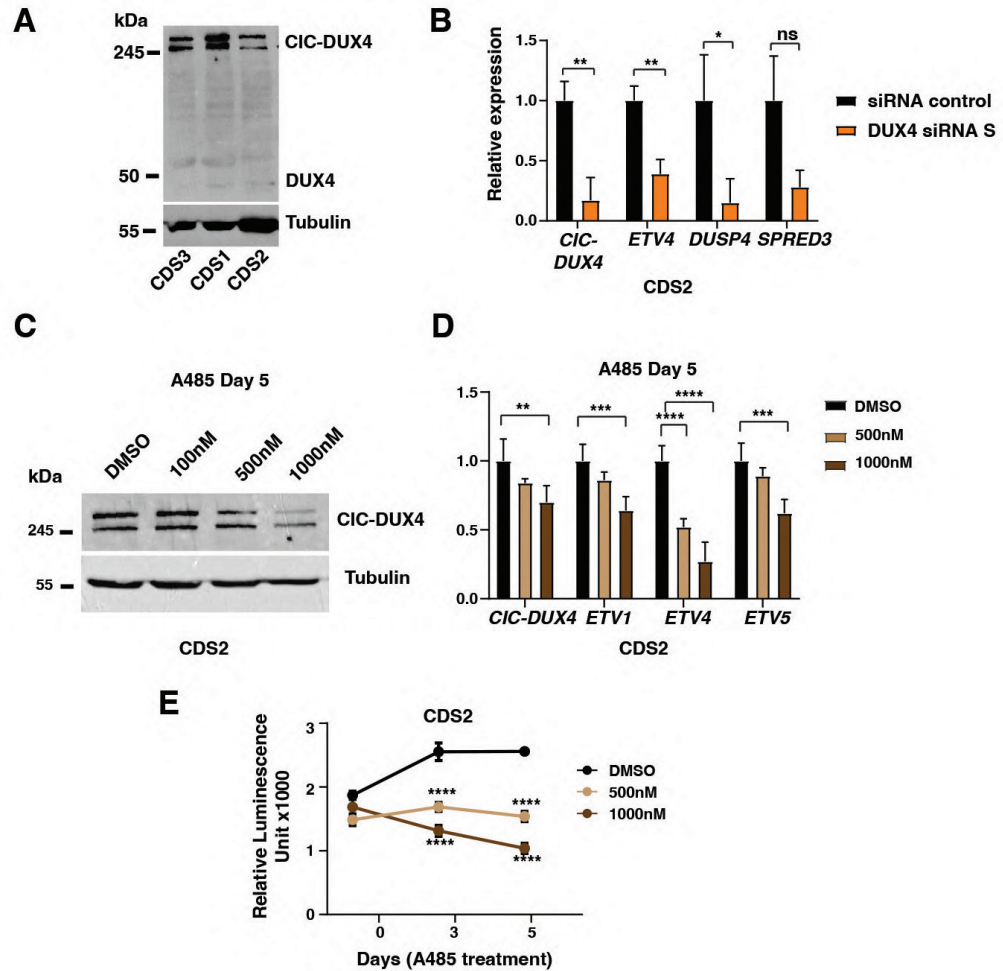


Figure S1: (A) Western Blot showing CIC-DUX4 as well as endogenous DUX4 protein levels across CDS1, CDS2 and CDS3 cell lines. (B) RT-qPCR analysis of the expression levels for a panel of established CIC-DUX4 target genes upon the depletion of the fusion protein in CDS2 cells. Data are presented as mean \pm SD, with n=3 per group. Gene expression levels were compared by two-way ANOVA. (C) Western Blot showing the decrease in CIC-DUX4 protein levels in CDS2 cells treated with increasing concentrations of A-485. (D) RT-qPCR analysis of the expression levels for CIC-DUX4 and a panel of fusion protein target genes in the CDS2 cell line treated with two different concentrations of A-485. Data are presented as mean \pm SD, with n=3 per group. Gene expression levels were compared by two-way ANOVA. (E) Changes in CDS1 proliferation upon treatment with increasing concentration of A-485, as assessed by luminescence. Data are presented as mean \pm SD, with n=4 per group. Statistical analyses were done using two-way ANOVA.

Figure S2

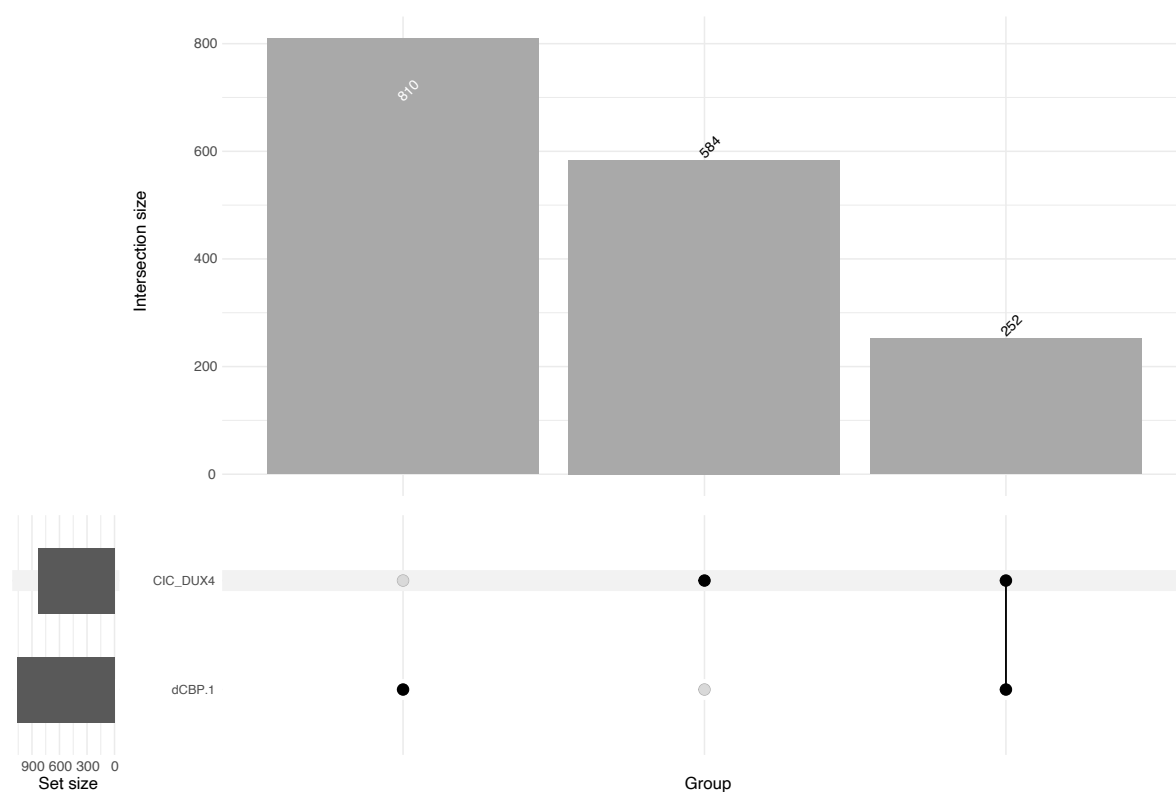


Figure S2 :Upset plot showing the number of common downregulated genes in CDS2 following CIC-DUX4 depletion or dCBP-1 treatment and their intersection. Vertical bars show the number common genes (intersection size) from a given set of methods (bottom filled connected circles). Horizontal bars illustrate the total number of genes (set size) output from each integration method.

Figure S3

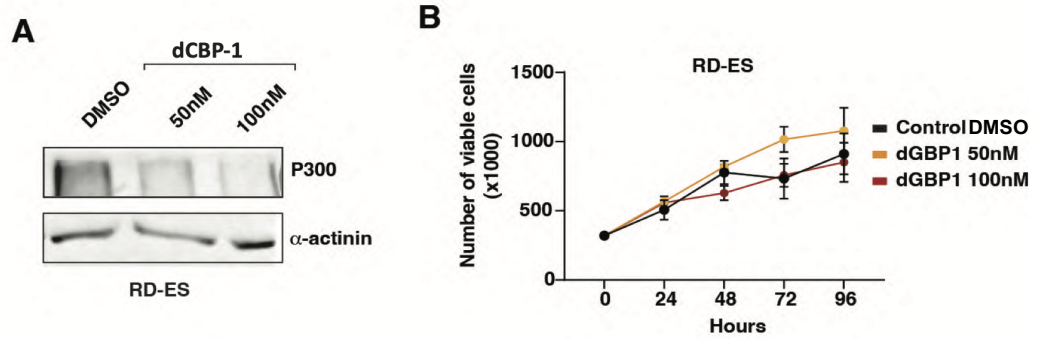


Figure S3: (A) Western blot showing the decrease in p300 protein levels in the RD-ES Ewing sarcoma cell line treated with increasing concentrations of the p300 protein degrader dCBP-1. **(B)** Plots depicting the lack of changes in cellular proliferation upon treatment of the RD-ES line with two different concentrations of dCBP-1, as assessed by relative luminescence. Data are presented as mean \pm SD, with n=4 per group. Statistical analyses were done using two-way ANOVA.

Supplementary Tables 1-6

Table S1. PCR primers

Gene	Forward primer	Reverse primer
<i>GAPDH</i>	5'-GTCTCTCTGACTTCAACAGCG-3'	5'-ACCACCCTGTTGCTGTAGCCAA-3'
<i>TBP</i>	5'-CGGCTGTTTAACCTCGCTTC-3'	5'-CACACGCCAAGAAACAGTGA-3'
<i>CIC-DUX4(CDS1)</i>	5'-CTCACCCAGCTCGGACTCT-3'	5'-ACTCCCCTGGGACGTGG-3'
<i>CIC-DUX4 (CDS2)</i>	5'-CTCACCCAGCTCGGACTCT-3'	5'-GGAGTGCAGACCAGG-3'
<i>EP300</i>	5'-GCTTCAGACAAGTCTTGGCAT-3'	5'-ACTACCAGATCGCAGCAATTC-3'
<i>ETV1</i>	5'-GCAAGAACGCTTCTGGC-3'	5'-CCTTCCCGATACATTCT-3'
<i>ETV4</i>	5'-AGGAACAGACGGACTTCGCCTA-3'	5'-CTGGGAATGGTCGCAGAGGTT-3'
<i>ETV5</i>	5'-TCAGCAAGTCCCTTTATGGTC-3'	5'-GCTCTTCAGAATCGTGAGCCA-3'

Table S2. Primary antibodies for Western blot

Antibodies	Source	Identifier
Rabbit polyclonal anti-DUX4 C-terminal	Origene	AP51343PU-N
Rabbit monoclonal p300 (D2X6N)	Cell signaling	54062
Mouse monoclonal anti- α -actinin	Sigma-aldrich	05-384
Mouse monoclonal anti- α -tubulin	Sigma-aldrich	T6074-100UL

Table S3. Antibodies for Chromatin immunoprecipitation

Antibodies	Source	Identifier
Rabbit polyclonal anti-DUX4 C-terminal	Origene	AP51343PU-N
Rabbit monoclonal p300 (D2X6N)	Cell signaling	54062
Anti-trimethyl-Histone H3 (Lys4)	Merck	07-473
Histone H3K27ac	Active Motif	39133
Anti-Histone H3 (mono methyl K4), ChIP grade	Abcam	ab8895

Table S4. CIC-DUX4 peaks

Chromosome number	Genome coordinates		Relation to neighboring genes
chr1	12689039	12689881	Distal
chr1	41921326	41922608	Distal
chr1	42420190	42422423	Distal
chr1	43146903	43147846	TSS
chr1	46268094	46269083	TSS
chr1	51435413	51438760	TSS
chr1	52522370	52524108	TSS
chr1	53704332	53707143	TSS
chr1	58870890	58872591	Distal
chr1	58906674	58908865	Distal
chr1	65935448	65938537	Distal
chr1	65992044	65994045	TSS
chr1	78443353	78445167	TSS
chr1	78469209	78470440	TSS
chr1	86045185	86046336	TSS
chr1	89196766	89197894	Distal
chr1	92149449	92150981	Distal
chr1	92248675	92250890	Distal
chr1	94041220	94042981	Distal
chr1	120557180	120558858	TSS
chr1	150207989	150209405	TSS
chr1	150335241	150337010	TSS
chr1	150337231	150339148	TSS
chr1	150539465	150541648	TSS
chr1	151042700	151043421	TSS
chr1	151952315	151954319	Distal
chr1	153853077	153854927	TSS
chr1	153895592	153896682	TSS
chr1	156570542	156571619	TSS
chr1	160255021	160255268	TSS
chr1	161015509	161016473	TSS
chr1	161102644	161103702	TSS
chr1	168434999	168437326	Distal

chr1	168551210	168552768	Distal
chr1	172428544	172431474	Distal
chr1	181068266	181069409	TSS
chr1	183805782	183806939	Distal
chr1	184579985	184580965	TSS
chr1	204475496	204477414	TSS
chr1	205719317	205720379	TSS
chr1	209757074	209759035	TSS
chr1	209759272	209760635	TSS
chr1	209770647	209771591	Distal
chr1	209788716	209790725	Distal
chr1	209791597	209794239	Distal
chr1	234736124	234744261	TSS
chr1	234859134	234860739	TSS
chr1	235461488	235462805	Distal
chr1	244999185	245000121	TSS
chr1	249239829	249240600	Distal
chr2	1569954	1571366	Distal
chr2	1628916	1630464	Distal
chr2	1655699	1662171	Distal
chr2	1681525	1685252	Distal
chr2	1701717	1705128	Distal
chr2	1705566	1706572	Distal
chr2	1709718	1712864	TSS
chr2	1718624	1719977	TSS
chr2	1720376	1722561	TSS
chr2	1724008	1729975	TSS
chr2	1730308	1731930	TSS
chr2	1732590	1737096	TSS
chr2	1740737	1742194	TSS
chr2	1742509	1743697	TSS
chr2	1745278	1747082	TSS
chr2	1748936	1754243	TSS
chr2	1754499	1757667	Distal
chr2	1758604	1760444	Distal
chr2	3644049	3645445	TSS
chr2	9548807	9549683	Distal
chr2	12316345	12318460	Distal
chr2	20101425	20102656	TSS
chr2	24296284	24299552	TSS
chr2	25351897	25352165	Distal
chr2	27273417	27274369	TSS
chr2	27545585	27546807	TSS
chr2	27849149	27850533	TSS
chr2	31541726	31543125	Distal
chr2	38385237	38386267	Distal
chr2	43985761	43987438	Distal
chr2	46561905	46563505	TSS
chr2	47417896	47421277	TSS
chr2	47496272	47498958	Distal
chr2	48094241	48095339	Distal
chr2	65527835	65530319	Distal
chr2	65560535	65561094	Distal
chr2	65576481	65579175	Distal
chr2	65640458	65641446	Distal
chr2	65655365	65657706	TSS
chr2	65661145	65662872	TSS
chr2	65663490	65665550	TSS
chr2	67663655	67665016	Distal
chr2	88927387	88928046	TSS
chr2	98485316	98486465	Distal
chr2	98750201	98751716	Distal
chr2	109294530	109295353	Distal
chr2	134474050	134477233	Distal
chr2	149403463	149404168	TSS
chr2	179143396	179144604	Distal
chr2	197789536	197790884	TSS
chr2	201753453	201754963	TSS
chr2	203130105	203132728	TSS
chr2	207997786	208001149	TSS
chr2	208575219	208576068	TSS
chr2	216979701	216981012	TSS
chr2	224588362	224590900	TSS
chr2	238623947	238625292	Distal
chr3	9439954	9442051	TSS
chr3	9807973	9811293	TSS
chr3	53914692	53915668	TSS
chr3	57541167	57542040	TSS
chr3	63953431	63954652	TSS

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chr3	99427444	99440050	Distal
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chr3	101404551	101406135	TSS
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chr3	122101419	122102720	TSS
chr3	122608308	122609862	Distal
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chr3	128597133	128598237	TSS
chr3	133163026	133163848	Distal
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chr3	149686486	149687777	TSS
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chr3	152972520	152976486	Distal
chr3	159398625	159400762	Distal
chr3	161607089	161608525	Distal
chr3	165518483	165520097	Distal
chr3	184305610	184309297	Distal
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chr3	185647213	185648902	TSS
chr3	185649771	185655147	TSS
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chr3	185789997	185794952	Distal
chr3	185798535	185800154	Distal
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chr5	43066679	43068389	TSS

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chr5	89705820	89706562	TSS
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chr6	139011811	139013189	TSS
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chr6	148841436	148847042	TSS
chr6	164497270	164498848	Distal
chr6	166289425	166292057	TSS
chr6	166395776	166399217	TSS
chr6	166399451	166400252	TSS
chr6	166419708	166421145	TSS
chr6	166878846	166881964	TSS
chr6	168904786	168908016	Distal
chr7	135845	138157	TSS

chr7	8009567	8013264	TSS
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chr7	23511079	23513111	TSS
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chr7	30634800	30637145	TSS
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chr7	38218022	38219806	TSS
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chr7	157950763	157953053	Distal
chr8	1463246	1467015	TSS
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chr8	6414562	6420047	TSS
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chr8	22399222	22400303	Distal
chr8	24811978	24812778	TSS
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chr8	25441054	25444176	TSS
chr8	25877574	25887096	Distal
chr8	27750746	27754148	Distal
chr8	27757674	27759687	Distal
chr8	27840033	27843391	TSS
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chr8	29200838	29205391	TSS
chr8	29208721	29209529	TSS
chr8	29663590	29666229	TSS
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chr8	130704142	130705842	Distal
chr8	130720215	130723479	Distal
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chr8	140875678	140878097	TSS
chr8	141473233	141474869	TSS
chr8	141517401	141519124	TSS
chr9	14207775	14211760	Distal
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chr9	78750369	78752388	Distal
chr9	86736778	86738194	Distal
chr9	91660446	91678111	Distal
chr9	91707591	91708721	Distal

chr9	91712119	91717990	Distal
chr9	91779386	91780685	Distal
chr9	91789071	91792472	TSS
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chr9	98980052	98980460	TSS
chr9	127420195	127423664	TSS
chr9	127424611	127426894	TSS
chr9	128776279	128777113	Distal
chr9	140222124	140222934	Distal
chr9	140269795	140270629	Distal
chr9	140271579	140273767	Distal
chr10	1074588	1075500	Distal
chr10	1075692	1076977	Distal
chr10	3234829	3236532	Distal
chr10	4066038	4067634	TSS
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chr10	4492525	4495503	Distal
chr10	6060466	6061728	Distal
chr10	13764502	13765884	Distal
chr10	18294444	18296030	Distal
chr10	21808045	21809335	TSS
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chr10	22012681	22014502	Distal
chr10	65028071	65029558	TSS
chr10	75503191	75504529	TSS
chr10	79011462	79013411	Distal
chr10	79044754	79048401	Distal
chr10	79049045	79051008	Distal
chr10	82299577	82302812	TSS
chr10	98160392	98162279	Distal
chr10	99213719	99214507	Distal
chr10	99599178	99600786	Distal
chr10	102045423	102046122	TSS
chr10	104004719	104006281	TSS
chr10	104040083	104041062	TSS
chr10	111724942	111725868	TSS
chr10	111726335	111727882	TSS
chr10	115613032	115614558	TSS
chr11	1022449	1023723	Distal
chr11	1964786	1965815	Distal
chr11	2958740	2960430	Distal
chr11	2965184	2965669	Distal
chr11	2966303	2967864	Distal
chr11	3373462	3379170	Distal
chr11	7911510	7913776	Distal
chr11	22761669	22765518	Distal
chr11	27315343	27317945	Distal
chr11	32467396	32469312	Distal
chr11	33100109	33101478	Distal
chr11	33280167	33280885	TSS
chr11	33673910	33675132	Distal
chr11	34363154	34364328	Distal
chr11	35269633	35271280	Distal
chr11	36764640	36766678	Distal
chr11	43574941	43578107	TSS
chr11	43702685	43703986	TSS
chr11	46299953	46303851	TSS
chr11	46344468	46347764	Distal
chr11	46638077	46640787	TSS
chr11	47560203	47560833	TSS
chr11	47789074	47790174	TSS
chr11	57412174	57414442	TSS
chr11	57414780	57417233	TSS
chr11	57417537	57421313	TSS
chr11	58689910	58691260	Distal
chr11	62607130	62609477	TSS
chr11	65192392	65195480	TSS
chr11	65265883	65274193	TSS
chr11	67007996	67009044	TSS
chr11	69065111	69067043	TSS
chr11	70806290	70808332	Distal
chr11	74970655	74974120	Distal
chr11	76154795	76156284	TSS
chr11	77600674	77602776	Distal
chr11	94526588	94528523	TSS
chr11	95523673	95525403	TSS
chr11	115227247	115229099	Distal
chr11	117979930	117981028	Distal

chr11	118276938	118278177	Distal
chr11	122602970	122605382	Distal
chr11	122933748	122934948	TSS
chr11	125037403	125040762	TSS
chr11	125048534	125053004	Distal
chr11	125216045	125216666	Distal
chr11	125495882	125496739	TSS
chr11	126099689	126102552	Distal
chr11	128062618	128066209	Distal
chr11	128104587	128106819	Distal
chr11	128158569	128161746	TSS
chr11	128262998	128266455	Distal
chr11	128316440	128318211	Distal
chr11	128318422	128321307	Distal
chr11	128321738	128331863	Distal
chr11	128332504	128342770	Distal
chr11	128342935	128345452	Distal
chr11	128360810	128391610	TSS
chr11	128392574	128395929	TSS
chr11	128413179	128416452	TSS
chr11	128419395	128424760	TSS
chr12	95320	95799	Distal
chr12	863462	866397	TSS
chr12	2364890	2365298	Distal
chr12	4223981	4228726	TSS
chr12	4242758	4244716	Distal
chr12	4244898	4246531	Distal
chr12	4384868	4387017	TSS
chr12	4396322	4397375	Distal
chr12	4401106	4403177	Distal
chr12	4413194	4414828	Distal
chr12	4415839	4416991	Distal
chr12	4647010	4648490	TSS
chr12	7052465	7053813	TSS
chr12	8057604	8059081	Distal
chr12	8090377	8091212	Distal
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chr12	10873443	10875093	TSS
chr12	12657754	12660346	TSS
chr12	12867457	12869559	TSS
chr12	12871148	12876600	TSS
chr12	13317915	13319117	Distal
chr12	14795402	14797668	Distal
chr12	26081197	26082875	Distal
chr12	49462455	49463424	TSS
chr12	52279724	52280769	Distal
chr12	53873627	53876474	Distal
chr12	53876998	53879691	Distal
chr12	54672395	54675814	TSS
chr12	56390346	56391385	TSS
chr12	56509636	56511267	TSS
chr12	56552068	56554955	TSS
chr12	57106293	57111197	Distal
chr12	57117253	57120021	TSS
chr12	58138146	58139858	TSS
chr12	64798851	64799620	TSS
chr12	65720690	65722842	Distal
chr12	65903011	65906357	Distal
chr12	65996549	65998696	TSS
chr12	66220194	66224814	TSS
chr12	66225967	66227049	Distal
chr12	66228595	66229870	Distal
chr12	66234427	66235746	Distal
chr12	66239464	66241521	Distal
chr12	66270626	66271468	TSS
chr12	66271784	66277539	TSS
chr12	66284986	66288397	TSS
chr12	66292925	66294305	Distal
chr12	66323565	66325488	Distal
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chr12	66333625	66338295	Distal
chr12	66338989	66344864	Distal
chr12	66347075	66348358	Distal
chr12	66349080	66350731	Distal
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chr12	66358702	66366755	Distal
chr12	68099344	68100057	Distal
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chr12	111298468	111299910	Distal
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chr12	122239357	122240870	TSS
chr12	123010749	123012540	TSS
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chr12	125411754	125412886	TSS
chr12	125422103	125425402	TSS
chr12	129192702	129193811	TSS
chr12	132172368	132174964	Distal
chr12	132478838	132481804	Distal
chr12	132873643	132877401	Distal
chr12	133188003	133190272	TSS
chr12	133190650	133194882	TSS
chr12	133219199	133221360	Distal
chr12	133221847	133222979	Distal
chr12	133249043	133249783	Distal
chr12	133255091	133257857	Distal
chr12	133258917	133263350	TSS
chr12	133265917	133287091	TSS
chr12	133288065	133293599	TSS
chr13	30130657	30131884	Distal
chr13	30607684	30608830	Distal
chr13	33924965	33926545	TSS
chr13	37573624	37576427	TSS
chr13	37632390	37633569	TSS
chr13	39771165	39772344	Distal
chr13	40110419	40111707	Distal
chr13	50017268	50018126	TSS
chr13	53225887	53226781	TSS
chr13	77902360	77904645	TSS
chr13	80932256	80936432	Distal
chr13	81009789	81012365	Distal
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chr13	98796381	98798314	TSS
chr13	110352210	110353558	Distal
chr13	110428988	110431330	TSS
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chr13	114553720	114554718	Distal
chr14	21561658	21562716	TSS
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chr14	21735426	21737573	TSS
chr14	23789480	23790374	TSS
chr14	23987569	23989193	Distal
chr14	24701706	24703685	TSS
chr14	35449850	35451651	TSS
chr14	35589801	35593317	TSS
chr14	50412170	50414178	Distal
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chr14	58893881	58897755	TSS
chr14	63670187	63672757	TSS
chr14	63761127	63763073	TSS
chr14	75229264	75229894	TSS
chr14	75232107	75232804	TSS
chr14	75746022	75747994	TSS
chr14	89793315	89795893	Distal
chr14	89805562	89807943	Distal
chr14	89894301	89897574	TSS
chr14	89908669	89910244	Distal
chr14	102276146	102277319	TSS
chr15	30917703	30918236	TSS
chr15	38545461	38550458	TSS
chr15	40737496	40738705	TSS
chr15	49201961	49203859	Distal
chr15	49255616	49257361	TSS
chr15	52943827	52945993	TSS
chr15	64993388	64994614	TSS
chr15	66661166	66662736	TSS
chr15	69743674	69745040	TSS
chr15	73988767	73989880	Distal
chr15	75015972	75016434	TSS
chr15	77779494	77780620	Distal
chr15	89740577	89741325	Distal
chr15	93424775	93425747	TSS
chr15	93443030	93447453	TSS
chr15	99341862	99345017	TSS
chr15	100257097	100261888	TSS

chr15	101441029	101444799	Distal
chr15	101727675	101729196	TSS
chr16	635537	638551	TSS
chr16	895479	897736	Distal
chr16	4460141	4461215	Distal
chr16	15110053	15111644	Distal
chr16	15360671	15362170	Distal
chr16	18800046	18801167	TSS
chr16	19117117	19118205	Distal
chr16	21564388	21565566	Distal
chr16	22738365	22740940	Distal
chr16	23142817	23144651	Distal
chr16	23222376	23223607	Distal
chr16	23234897	23237966	Distal
chr16	23323359	23325529	Distal
chr16	23389801	23391378	Distal
chr16	24551646	24553786	TSS
chr16	26037594	26039223	Distal
chr16	30886822	30887992	TSS
chr16	30968193	30969077	TSS
chr16	31463104	31464217	Distal
chr16	31725050	31725573	TSS
chr16	49788297	49790309	TSS
chr16	49790627	49791709	TSS
chr16	49792704	49793921	Distal
chr16	49794264	49796163	Distal
chr16	49878036	49879325	Distal
chr16	49883354	49888314	TSS
chr16	52845956	52848114	Distal
chr16	53113166	53115328	TSS
chr16	53123790	53126533	TSS
chr16	53241887	53243983	TSS
chr16	57333334	57334557	TSS
chr16	65035404	65036877	Distal
chr16	67062141	67062696	TSS
chr16	69444047	69444769	Distal
chr16	70461810	70463260	TSS
chr16	70557676	70558656	TSS
chr16	70610267	70611151	Distal
chr16	75467522	75468769	TSS
chr16	81521228	81524099	Distal
chr16	85159119	85159744	Distal
chr16	85159898	85161310	Distal
chr16	85182205	85183211	Distal
chr16	85205912	85208756	TSS
chr16	85237186	85240238	TSS
chr16	85713370	85715506	Distal
chr16	87326864	87329343	TSS
chr16	87402765	87403755	TSS
chr16	87421487	87422032	TSS
chr16	89766313	89766730	TSS
chr17	643093	644906	Distal
chr17	900896	902520	TSS
chr17	903672	904913	Distal
chr17	2025917	2027607	TSS
chr17	4703800	4704520	Distal
chr17	4811564	4812485	TSS
chr17	4849553	4850716	TSS
chr17	4870350	4871111	TSS
chr17	5795997	5801307	Distal
chr17	7123732	7124619	TSS
chr17	7209983	7210711	TSS
chr17	7487174	7487946	TSS
chr17	7740005	7741129	TSS
chr17	7759758	7760447	TSS
chr17	7760628	7761881	TSS
chr17	7783857	7787710	TSS
chr17	7789701	7790884	TSS
chr17	7791201	7793583	TSS
chr17	8076491	8077376	TSS
chr17	8089736	8091721	TSS
chr17	8262226	8264767	TSS
chr17	8760037	8763143	Distal
chr17	17629234	17630502	TSS
chr17	19091257	19091633	TSS
chr17	28443529	28444717	TSS
chr17	33090194	33092360	Distal
chr17	34100599	34102088	TSS
chr17	36956393	36957045	TSS

chr17	38601077	38601850	TSS
chr17	38802985	38804327	TSS
chr17	40927365	40928829	Distal
chr17	40948735	40950671	TSS
chr17	41321911	41323076	TSS
chr17	41437470	41439048	TSS
chr17	41600547	41605509	Distal
chr17	41607377	41614745	TSS
chr17	41615121	41617467	TSS
chr17	41617698	41622815	TSS
chr17	41623739	41625425	TSS
chr17	42214807	42216547	Distal
chr17	43225182	43225583	TSS
chr17	43225820	43226610	TSS
chr17	43237322	43238274	TSS
chr17	48507272	48510482	TSS
chr17	48944513	48946373	TSS
chr17	56070838	56072002	Distal
chr17	56158365	56159638	TSS
chr17	57231684	57232782	TSS
chr17	57863824	57864580	TSS
chr17	57914486	57918921	TSS
chr17	63213571	63215001	Distal
chr17	65557653	65559157	Distal
chr17	74015285	74016779	Distal
chr18	9942	10318	Distal
chr18	3453780	3454824	TSS
chr18	3593000	3596160	TSS
chr18	3602694	3604956	TSS
chr18	4643625	4646530	Distal
chr18	45084133	45085231	TSS
chr18	55447144	55448720	Distal
chr18	60524660	60525533	Distal
chr18	70322401	70325451	Distal
chr18	73946076	73947419	TSS
chr19	402241	403747	TSS
chr19	1997538	1998719	Distal
chr19	2003541	2005501	Distal
chr19	2005864	2010272	Distal
chr19	2145691	2146544	Distal
chr19	4035553	4036975	Distal
chr19	4246961	4247311	TSS
chr19	8654725	8656731	TSS
chr19	8657920	8660456	TSS
chr19	8661541	8662692	Distal
chr19	8663644	8665294	Distal
chr19	8665963	8668057	Distal
chr19	8780868	8783474	Distal
chr19	8783653	8786665	Distal
chr19	8792055	8793640	Distal
chr19	9731608	9733400	TSS
chr19	9982358	9983937	Distal
chr19	10081467	10083390	Distal
chr19	10765981	10767477	TSS
chr19	12833436	12835091	TSS
chr19	13894028	13894557	Distal
chr19	13907088	13908213	TSS
chr19	15333462	15334243	TSS
chr19	15441073	15442222	TSS
chr19	38878795	38879246	TSS
chr19	38879572	38880932	TSS
chr19	38881492	38885198	TSS
chr19	38886807	38893575	TSS
chr19	39183752	39184705	Distal
chr19	41768997	41770261	TSS
chr19	41814100	41817146	TSS
chr19	41830091	41831043	TSS
chr19	41833966	41835133	TSS
chr19	42413998	42416664	Distal
chr19	45379777	45381237	Distal
chr19	45393088	45393901	TSS
chr19	45594929	45596393	TSS
chr19	45596819	45598213	TSS
chr19	49160003	49160826	Distal
chr19	50316360	50317326	TSS
chr19	52208248	52216385	TSS
chr19	52552215	52552870	TSS
chr19	58237849	58240496	TSS
chr20	1841277	1843372	Distal

chr20	1864984	1866210	Distal
chr20	2451227	2451884	TSS
chr20	4492516	4495848	Distal
chr20	17949975	17951048	TSS
chr20	30160146	30160770	TSS
chr20	30191565	30192908	TSS
chr20	35484390	35485774	Distal
chr20	39631340	39632529	Distal
chr20	39658513	39659906	TSS
chr20	46270952	46272703	Distal
chr20	47895154	47895814	TSS
chr20	52193138	52194310	TSS
chr20	52194677	52197961	TSS
chr20	52204946	52207025	TSS
chr20	52237662	52240973	TSS
chr20	52353344	52357737	TSS
chr20	52367220	52370353	TSS
chr20	52405885	52408341	Distal
chr20	52481314	52484603	TSS
chr20	52515036	52517763	Distal
chr20	52555806	52558582	TSS
chr20	59816058	59819962	Distal
chr20	59823441	59827026	TSS
chr20	59829039	59833275	TSS
chr20	59833430	59850207	TSS
chr20	59850378	59858007	Distal
chr20	59865292	59870704	Distal
chr20	59871803	59875255	Distal
chr20	59906823	59925047	Distal
chr20	59961778	59963300	TSS
chr20	59963467	59974143	Distal
chr20	59976016	59979184	Distal
chr20	59998111	60000195	Distal
chr20	60000835	60004638	Distal
chr20	60357403	60358807	Distal
chr20	60362653	60366676	Distal
chr20	60432902	60434706	Distal
chr20	60440233	60441741	Distal
chr20	60523896	60524531	Distal
chr20	60529573	60532754	TSS
chr20	61970629	61972138	Distal
chr21	27540564	27541817	TSS
chr21	33471373	33472752	Distal
chr21	33893293	33895015	Distal
chr21	34852648	34853409	TSS
chr21	34914533	34918283	TSS
chr21	43768620	43770104	Distal
chr21	44250745	44252288	Distal
chr21	44252465	44255099	Distal
chr21	44343874	44345054	TSS
chr21	44841846	44845774	TSS
chr21	45631294	45633383	TSS
chr22	18243015	18244174	Distal
chr22	19982285	19983207	Distal
chr22	22005119	22006461	TSS
chr22	25289700	25291620	Distal
chr22	25480754	25483096	Distal
chr22	38093012	38093683	TSS
chr22	39100606	39101774	TSS
chr22	43011016	43011982	TSS
chr22	45819130	45820618	Distal
chr22	46961090	46965063	Distal
chr22	49975584	49976363	Distal
chrX	41192827	41193777	TSS
chrX	54555955	54556470	TSS
chrX	116225419	116231040	Distal

Table S5. CIC-DUX4 direct target genes

ACAD9	ANGPT2	BLOC1S2
ACADVL	ANKS1A	BRD2
ACTR8	ANP32E	BRD8
ADAMTS10	ARHGAP11B	BTF3L4
ADH5	ARID4A	C12orf4
AGBL5	ARRDC3	C12orf57
AGBL5-AS1	ATG13	CAB39L
ALG5	ATXN7	CAMK1

CAMK1G
CASC11
CBFB
CBX5
CCDC58
CCDC94
CCDC97
CCNYL1
CDH4
CDK14
CDKAL1
CDKN1B
CDKN2C
CEP44
CEP57
CETN3
CFDP1
CHD2
CHD3
CHEK1
CKS2
CMSS1
CNTD1
COA3
COG4
COX20
COX7A2
CREB3
CREB3L1
CRH
CYB5D1
CYR61
DCLRE1A
DDX39B
DDX39B-AS1
DDX3X
DEDD
DLG4
DLGAP1-AS1
DLGAP1-AS2
DNAJB11
DNAJB4
DUSP4
DUSP6
EIF2AK3
EIF5A
EPC2
ERVH48-1
ETS1
ETV1
ETV4
ETV5
EXOSC8
FAM162A
FAM214A
FAM228B
FAM76B
FAM98C
FBXO8
FGF1
FNBP4
FOS
FUBP1
FUZ
GABBR1
GABPB2
GARS
GART
GATAD2B
GBF1
GCNT2
GGN
GMPR2
GNL3L
GPATCH4
GPN1
GTPBP1
GTPBP2
HARBI1

HBP1
HEXIM1
HEXIM2
HIPK3
HIVEP1
HM13-AS1
HMGB2
HNRNPA1
HNRNPA1P10
HNRNPAB
HNRNPC
HNRNPUL1
HSD17B12
HSPA8
ID1
IGF2BP3
IQCG
JMJD1C
KDM2A
KIAA0391
KIAA0586
KIF20A
KLF7
KNTC1
LEPR
LRCOL1
MAGOH
MALAT1
MAP3K13
MAST2
MAT2B
MGME1
MIR1257
MIR181A2HG
MIR21
MIR301B
MIR3153
MIR3175
MIR3184
MIR423
MIR4279
MIR4519
MIR5188
MIR570
MPDU1
MPV17
MRPS18B
MYC
MYL6
MYLK-AS1
N4BP2
NAA38
NACA
NBR1
NECAP1
NEDD8
NEDD8-MDP1
NHLRC2
NHSL1
NIF3L1
NOP58
NSRP1
NUCKS1
OAZ2
P2RX2
PABPN1
PCNP
PDE12
PDE8B
PEX19
PFN2
PGAM5
PGAP1
PIP4K2B
PNISR
POLDIP3
POLE
POMZP3
PPIL3

PPP1R10
PPP1R37
PPP2R3C
PPP2R5C
PRR11
PXDN
PXMP2
RAB40C
RAD51AP1
RBBP6
RBPJ
RHEBL1
RHOJ
RNF139
RNF139-AS1
RNU12
RPL24
RPL35A
RPL41
RPLP1
RPRD2
RPS15A
RPS18
RPS6KA2-IT1
RPSAP52
RSRC2
SEC24C
SEC31A
SECISBP2
SETD1A
SETD5
SETDB2
SF3B3
SH2D4B
SHC3
SHC4
SKA2
SKIDA1
SMARCE1
SNORD12C
SNORD84
SNORD95
SNRNP35
SNRNPB
SNX5
SON
SPAG7
SPRED1
SPRED3
SPRY4
SRA1
SRP54
SRSF3
STARD3NL
SUGT1
SUOX
SUPT20H
TAF11
TARS
TBCCD1
TGIF1
THAP9
THAP9-AS1
TIMM22
TIMM9
TLN1
TMEM50B
TNPO2
TOB1
TOB1-AS1
TOMM40
TRA2B
TRERF1
TRIOBP
TRMT12
TSPAN31
TTC32
TUBB
TXNDC12

UBC
USF1
VGF
VPS52
WDR74
XPOT
YBX1
YBX3

YLPM1
YPEL4
ZC3H10
ZFAS1
ZFAT
ZIC1
ZIC4
ZNF432

ZNF561
ZNF671
ZNF720
ZNFX1
ZSWIM4

Table S6. Clinicopathological information of primary CIC-DUX4 frozen samples

Sample name	Age at diagnosis	Gender	Tumor location	Tumor size	Metastasis
CIC1	29	F	thigh	3.7 cm	No
CIC2	66	M	neck	6.1 cm	No
CIC3	25	F	thigh	7.5 cm	lungs