

# dbSUPER: an integrated database of super-enhancers in mouse and human genome

Aziz Khan<sup>1</sup> and Xuegong Zhang<sup>1,2,\*</sup>

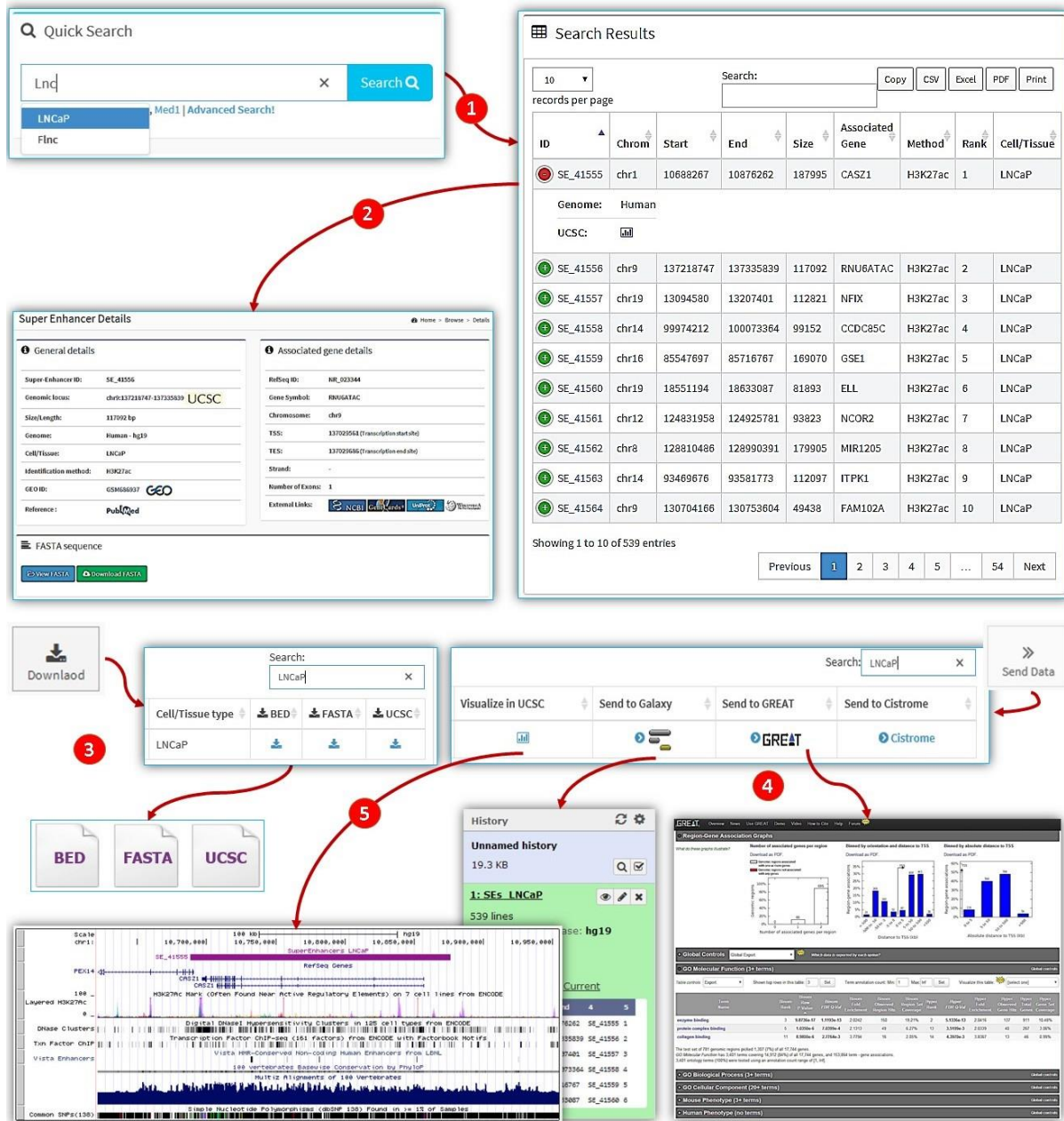
<sup>1</sup> MOE Key Laboratory of Bioinformatics, Bioinformatics Division and Center for Synthetic and Systems Biology, TNLIS/Department of Automation, Tsinghua University, Beijing, 100084, China

<sup>2</sup> School of Life Sciences, Tsinghua University, Beijing, 100084, China

\* To whom correspondence should be addressed. Tel: +86-10-62794919; Fax: +86-10-62773552; Email: zhangxg@tsinghua.edu.cn

---

## **SUPPLEMENTARY DATA**



**Figure S1.** Screenshots depicting a demo run for cell-type LNCaP. In step 1, dbSUPER outputs a dynamic table, which lists all the super-enhancers in LNCaP. Each row in the table is a super-enhancer and each column contains information including super-enhancer id (SE\_ID) maintained by our database, chromosome location, size of each region, associated gene, method used to identify these regions, rank of each region based on ChIP-seq signal strength, cell/tissue type, genome and a link to UCSC to visualize each region. In step 2, once the user clicks SE\_ID (SE\_41556), a page will be displayed containing general details including locus, identification method, GEO, reference and etc. and associated gene information including gene symbol, TSS, TES, stand, number of exons etc. and also external links to NCBI, GeneCards, UniProt and Wikipedia. In step 3, user downloads the data for LNCaP in BED, FASTA and UCSC custom track format. In step 4, data have been transferred to Galaxy, Cistrome and GREAT servers for further downstream analysis. Step 5 shows a screenshot of visualized data in USCS genome browser (<http://genome.ucsc.edu/>).

**Upload BED**

✉️ dbsuperthu@gmail.com ✓

**Demo Analysis**

Select genome

Human genome (hg19)  
 Mus musculus (mm9)

Input BED file

Choose File Brd4\_mESC\_SRR500928\_peaks.bed ✓

Please, upload a BED file. Example BED

Minimum percentage of overlap ✓

10 %

Apply the minimum % of overlap on both, dbSUPER and your submitted regions.

Start Analysis

**Your Results** of overlap analysis

**Input settings**

Title: Demo Analysis  
 Minimum overlap: 10 %  
 Reciprocal: False  
 Genome: hg19

Submitted date: 2015-01-02 10:10:35

Download BED

**Cell-specific overlap analysis**

**Fetal Muscle**  
11

**Regions overlapped**

**Uploaded Regions**  
3,073

**Detailed list of overlapped regions**

10 records per page Search: Copy CSV Excel PDF Print

ID	Chrom	Start	Stop	Associated Gene	Method	Rank	Cell/Tissue	Genome
SE_00368	chr11	62298188	62315779	AHNAK	H3K27ac	368	Adipose Nuclei	hg19
SE_00513	chr1	154937948	154949498	SHC1	H3K27ac	513	Adipose Nuclei	hg19
SE_00761	chr16	30203152	30222185	MAPK3	H3K27ac	761	Adipose Nuclei	hg19
SE_02178	chr2	20637895	20653571	RHOB	H3K27ac	646	Aorta	hg19
SE_02525	chr5	14034644	14040630	TRIO	H3K27ac	290	Astrocytes	hg19

Showing 1 to 10 of 294 entries

Previous 1 2 3 4 5 ... 30 Next

**Figure S2:** Screenshot for the overlap analysis tool, shows a step-wise analysis and output results. In step 1, user uploads the bed file. In step 2, system send an email once analysis is performed. In step 3, once your will click the link provided email, results will be displayed. The overlapped regions can be downloaded in BED file or export to CSV, Excel, and PDF.

**Table S1:** List of all the cell/tissues types including the number of super-enhancers in each cell/tissue type, mean size (bp), method used to identify these super-enhancers, genome and reference.

Cell/Tissue type	Total SEs	Mean size(bp)	Identification Method	Genome	Reference
Embryonic stem cells	231	10434	Med1	mm9	Whyte W.A., et al. (2013)
pro-B Cells	395	19195	Med1	mm9	
Th Cells	436	49031	T-bet	mm9	
Myotubes	535	6451	MyoD	mm9	
Macrophage	961	14796	C/EBP-alpha	mm9	
Adipose Tissue	71	7544	H3K27ac	hg19	Hnisz D., et al. (2013)
MCF-7	117	36764	H3K27ac	hg19	
CD34 fetal	147	9719	H3K27ac	hg19	
RPMI-8402	220	53185	H3K27ac	hg19	
CD34 adult	234	11627	H3K27ac	hg19	
Bladder	249	26314	H3K27ac	hg19	
GM12878	257	42803	H3K27ac	hg19	
CD34 Primary RO01549	326	20320	H3K27ac	hg19	
Panc1	355	57636	H3K27ac	hg19	
Brain Mid Frontal Lobe	357	26878	H3K27ac	hg19	
H2171	357	44253	H3K27ac	hg19	
VACO 9m	371	16307	H3K27ac	hg19	
CD8 Naive 8pool	375	25291	H3K27ac	hg19	
HCT-116	387	37709	H3K27ac	hg19	
Right Ventricle	390	21241	H3K27ac	hg19	
CD4 Memory Primary 8pool	410	18686	H3K27ac	hg19	
DND41	442	48439	H3K27ac	hg19	
CD4p CD225int CD127p Tmem	444	22355	H3K27ac	hg19	
CD34 Primary RO01480	456	15639	H3K27ac	hg19	
CD8 Naive 7pool	462	15956	H3K27ac	hg19	
CD4p CD25- CD45RAp Naive	465	41184	H3K27ac	hg19	
CD4p CD25- CD45ROp Memory	474	34348	H3K27ac	hg19	
HCC1954	477	37310	H3K27ac	hg19	
Ovary	478	36505	H3K27ac	hg19	
CD4 Naive Primary 7pool	479	18267	H3K27ac	hg19	
Fetal Thymus	481	37231	H3K27ac	hg19	
Jurkat	487	38665	H3K27ac	hg19	
HepG2	497	13031	H3K27ac	hg19	
IMR90	502	25651	H3K27ac	hg19	
Psoas Muscle	505	44585	H3K27ac	hg19	
LNCaP	539	31592	H3K27ac	hg19	
VACO 503	556	24459	H3K27ac	hg19	
Thymus	559	25441	H3K27ac	hg19	
CD4 Naive Primary 8pool	571	19229	H3K27ac	hg19	
Pancreas	591	26467	H3K27ac	hg19	
Stomach Smooth Muscle	611	47158	H3K27ac	hg19	
NHDF-Ad	612	34957	H3K27ac	hg19	
Skeletal Muscle	618	47468	H3K27ac	hg19	
VACO 400	635	26721	H3K27ac	hg19	
MM1S	640	25687	H3K27ac	hg19	
Colon Crypt 3	644	25799	H3K27ac	hg19	
Skeletal Muscle Myoblast	645	29588	H3K27ac	hg19	
Astrocytes	650	26918	H3K27ac	hg19	
CD3	664	25415	H3K27ac	hg19	
Colon Crypt 1	665	36612	H3K27ac	hg19	

Adrenal Gland	680	36510	H3K27ac	hg19	
H1	684	11979	H3K27ac	hg19	
CD19 Primary	688	27988	H3K27ac	hg19	
HeLa	698	27419	H3K27ac	hg19	
Aorta	703	47682	H3K27ac	hg19	
CD8 Memory 7pool	712	21875	H3K27ac	hg19	
Brain Angular Gyrus	719	37502	H3K27ac	hg19	
CD34 Primary RO01536	733	32276	H3K27ac	hg19	
K562	742	21559	H3K27ac	hg19	
Duodenum Smooth Muscle	751	41611	H3K27ac	hg19	
CD56	763	30529	H3K27ac	hg19	
CD8 primary	776	35813	H3K27ac	hg19	
Adipose Nuclei	781	61369	H3K27ac	hg19	
NHLF	784	25701	H3K27ac	hg19	
CD4p CD25- Il17- PMAstim Th	867	49374	H3K27ac	hg19	
CD4p CD25- Il17p PMAstim Th17	871	30047	H3K27ac	hg19	
Right Atrium	889	41598	H3K27ac	hg19	
Brain Anterior Caudate	907	50427	H3K27ac	hg19	
Brain Hippocampus Middle	908	52322	H3K27ac	hg19	
HUVEC	912	31007	H3K27ac	hg19	
Fetal Intestine	919	35638	H3K27ac	hg19	
Small Intestine	946	38996	H3K27ac	hg19	
Colon Crypt 2	958	28185	H3K27ac	hg19	
CD20	970	52283	H3K27ac	hg19	
Left Ventricle	972	53594	H3K27ac	hg19	
Brain Cingulate Gyrus	1005	55203	H3K27ac	hg19	
CD4 Memory Primary 7pool	1015	28795	H3K27ac	hg19	
CD14	1019	60735	H3K27ac	hg19	
Fetal Intestine Large	1021	36090	H3K27ac	hg19	
Sigmoid Colon	1023	36027	H3K27ac	hg19	
HSMMtube	1029	43090	H3K27ac	hg19	
Brain Hippocampus Middle 150	1039	45278	H3K27ac	hg19	
Brain Inferior Temporal Lobe	1067	52615	H3K27ac	hg19	
u87	1073	39814	H3K27ac	hg19	
Gastric	1081	41615	H3K27ac	hg19	
Osteoblasts	1089	55146	H3K27ac	hg19	
Esophagus	1096	42336	H3K27ac	hg19	
HMEC	1099	28048	H3K27ac	hg19	
Spleen	1197	36440	H3K27ac	hg19	
Lung	1286	43932	H3K27ac	hg19	
Fetal Muscle	1339	30955	H3K27ac	hg19	
HBL1	461	46973	H3K27ac	hg19	Chapuy B., et al. (2013)
Ly1	530	53460	H3K27ac	hg19	
DHL6	566	33607	H3K27ac	hg19	
Toledo	782	36219	H3K27ac	hg19	
Ly4	786	37649	H3K27ac	hg19	
Ly3	790	31552	H3K27ac	hg19	
Tonsil	979	38910	H3K27ac	hg19	
NCI-H82	67	27253	H3K27ac	hg19	Christensen C.L., et al. (2014)
GLC16	102	19648	H3K27ac	hg19	
NCI-H69	129	28870	H3K27ac	hg19	