

Reporting Summary

Nature Portfolio wishes to improve the reproducibility of the work that we publish. This form provides structure for consistency and transparency in reporting. For further information on Nature Portfolio policies, see our [Editorial Policies](#) and the [Editorial Policy Checklist](#).

Statistics

For all statistical analyses, confirm that the following items are present in the figure legend, table legend, main text, or Methods section.

n/a	Confirmed
☐	☒ The exact sample size (<i>n</i>) for each experimental group/condition, given as a discrete number and unit of measurement
☐	☒ A statement on whether measurements were taken from distinct samples or whether the same sample was measured repeatedly
☐	☒ The statistical test(s) used AND whether they are one- or two-sided <i>Only common tests should be described solely by name; describe more complex techniques in the Methods section.</i>
☒	☐ A description of all covariates tested
☒	☐ A description of any assumptions or corrections, such as tests of normality and adjustment for multiple comparisons
☐	☒ A full description of the statistical parameters including central tendency (e.g. means) or other basic estimates (e.g. regression coefficient) AND variation (e.g. standard deviation) or associated estimates of uncertainty (e.g. confidence intervals)
☐	☒ For null hypothesis testing, the test statistic (e.g. <i>F</i> , <i>t</i> , <i>r</i>) with confidence intervals, effect sizes, degrees of freedom and <i>P</i> value noted <i>Give P values as exact values whenever suitable.</i>
☒	☐ For Bayesian analysis, information on the choice of priors and Markov chain Monte Carlo settings
☒	☐ For hierarchical and complex designs, identification of the appropriate level for tests and full reporting of outcomes
☐	☒ Estimates of effect sizes (e.g. Cohen's <i>d</i> , Pearson's <i>r</i>), indicating how they were calculated

Our web collection on [statistics for biologists](#) contains articles on many of the points above.

Software and code

Policy information about [availability of computer code](#)

Data collection	Flowcytometry data were collected with Cytotflex/Cytotflex S Flow Cytometer (Beckman Coulter). Cell sorting was performed using FACSARIA III Cell Sorter (BD). SHM library sequencing were gnenrated using DNBSEQ-T7 platform. RNA-seq: Libraries were gnenrated using VAHTS Universal V8 RNA-seq Library Prep Kit for Illumina kit, and Barcoded libraries were pooled and sequenced on the DNBSEQ-T7 platform. CUT&Tag: Barcoded libraries were pooled and sequenced on the DNBSEQ-T7 platform. 4C-HTGTS: libraries were sequencing on the DNBSEQ-T7 platform.CHIP-seq: libraries were sequencing on the DNBSEQ-T7 platform.
Data analysis	FlowJo software (Version 10.8.1), CytExpert (Version 2.3.1), Bowtie2 (version 2.3.5.1), Trim Galore (version 20.04.6), FastQC (version 0.11.9), MultiQC (version 1.12), Hisat2 (version 2.1.0), samtools (version 1.10.2), deepTools (version 3.5.1), IGV (version 2.18.2), GSEA(version 4.3.2), BWA (version 0.7.17), MACS3 (version 3.0.0a7), BEDTools (version 2.27.1).

For manuscripts utilizing custom algorithms or software that are central to the research but not yet described in published literature, software must be made available to editors and reviewers. We strongly encourage code deposition in a community repository (e.g. GitHub). See the Nature Portfolio [guidelines for submitting code & software](#) for further information.

Data

Policy information about [availability of data](#)

All manuscripts must include a [data availability statement](#). This statement should provide the following information, where applicable:

- Accession codes, unique identifiers, or web links for publicly available datasets
- A description of any restrictions on data availability
- For clinical datasets or third party data, please ensure that the statement adheres to our [policy](#)

Previously published datasets used in this study under accession numbers GSE29282, GSE60927 and SRP048895. Our Data from RNA-seq and H3K4me3 CUT&Tag have been deposited in NCBI GEO under the accession code GSE288059, Data from Pol II&H3K27me3 CUT&Tag and CFP1 ChIP-seq have been deposited under the accession code PRJNA1283973 and PRJNA1273711, and data from SHM of JH4 intron and 4C-HTGTS are available under the accession code PRJNA1187686. The remaining data are available within the article, Supplementary Information or Source Data file. Source data are provided with this paper.

Research involving human participants, their data, or biological material

Policy information about studies with [human participants or human data](#). See also policy information about [sex, gender \(identity/presentation\), and sexual orientation](#) and [race, ethnicity and racism](#).

Reporting on sex and gender

N/A

Reporting on race, ethnicity, or other socially relevant groupings

N/A

Population characteristics

N/A

Recruitment

N/A

Ethics oversight

N/A

Note that full information on the approval of the study protocol must also be provided in the manuscript.

Field-specific reporting

Please select the one below that is the best fit for your research. If you are not sure, read the appropriate sections before making your selection.

☒ Life sciences

☐ Behavioural & social sciences

☐ Ecological, evolutionary & environmental sciences

For a reference copy of the document with all sections, see [nature.com/documents/nr-reporting-summary-flat.pdf](https://www.nature.com/documents/nr-reporting-summary-flat.pdf)

Life sciences study design

All studies must disclose on these points even when the disclosure is negative.

Sample size

For each assay, experiments were conducted in at least two independent batches or with a minimum of 5–10 independent biological replicates per group. Required experimental sample sizes were estimated based on previous established protocols in the field. The sample sizes were adequate as the differences between experimental groups were reproducible. All n values are clearly indicated within the figure legends.

Data exclusions

No data were excluded from the analysis.

Replication

To confirm the reproducibility of our finding, experiments were performed at least two independent batches, or have at a minimum 5-10 independent biological replicates

Randomization

Randomization is not relevant to this study as different experiment groups were performed with uniform biological materials and by different individuals.

Blinding

Blinding was not applied, as experiments were performed by different individuals who were aware of the sample groupings. For bioinformatic analyses of high-throughput sequencing data, blinding was not relevant, as these were conducted using predefined automated pipelines.

Reporting for specific materials, systems and methods

We require information from authors about some types of materials, experimental systems and methods used in many studies. Here, indicate whether each material, system or method listed is relevant to your study. If you are not sure if a list item applies to your research, read the appropriate section before selecting a response.

Materials & experimental systems

n/a	Involved in the study
☐	☒ Antibodies
☐	☒ Eukaryotic cell lines
☒	☐ Palaeontology and archaeology
☐	☒ Animals and other organisms
☒	☐ Clinical data
☒	☐ Dual use research of concern
☒	☐ Plants

Methods

n/a	Involved in the study
☐	☒ ChIP-seq
☐	☒ Flow cytometry
☒	☐ MRI-based neuroimaging

Antibodies

Antibodies used

The following commercially-available antibodies were used. Catalog and clone are provided wherever such information is publicly available.

From BD Biosciences

1. Purified Rat Anti-Mouse CD16/CD32 (#553142), 1/50 dilution
2. PE anti-CD95 (#561985 clone Jo2(RUO)), 1/500 dilution
3. PerCP Cy5.5 anti-CD38 (#562770 clone 90/CD38), 1/500 dilution
4. biotin anti-CD38 (#553762 clone 90/CD38), 1/500 dilution
5. biotin anti-CD138 (#553713 clone 281-2), 1/500 dilution
6. APC-Cy7 anti-CD19 (#557655 clone 1D3), 1/500 dilution
7. PE anti-BP-1 (#553735 clone BP-1), 1/500 dilution
8. FITC anti-IgM (#553437 clone II/41), 1/500 dilution
9. biotin anti-IgM (#553436 clone II/41), 1/500 dilution
10. FITC anti-IgG1 (#553443 clone A85-1), 1/500 dilution
11. PE anti-IgG1 (#550083 clone A85-1), 1/500 dilution
12. BV421 anti-IgG1 (#742475 clone X56), 1/500 dilution
13. AF647 anti-BCL6 (#561525 clone K112-91), 1/100 dilution
14. BV605 anti-CD80 (#563052 clone 16-10A1), 1/100 dilution

From BioLegend

1. Zombie NIR (#423106), 1/1000 dilution
2. FITC anti-GL7 (#144604 clone GL7), 1/500 dilution
3. PE anti-CD95 (#152608 clone SA367H8), 1/500 dilution
4. APC anti-CD95 (#152604 clone SA367H8), 1/500 dilution
5. APC anti-CXCR4 (#146507 clone L276F12), 1/500 dilution
6. BV605 anti-CXCR4 (#146519 clone L276F12), 1/500 dilution
7. PE-Cy7 anti-CD86 (#105014 clone GL1), 1/500 dilution
8. BV510 anti-IgD (#405723 clone 11-26C. 2a), 1/500 dilution
9. biotin anti-IgD (#405734 clone 11-26C. 2a), 1/500 dilution
10. PE-Cy7 anti-CD38 (#102717 clone 90), 1/500 dilution
11. PerCP Cy5.5 anti-CD38 (#102722 clone 90), 1/500 dilution
12. PE anti-CD138 (#142503 clone 281-2), 1/500 dilution
13. BV421 anti-CCR6 (#129817 clone 29-2L17), 1/500 dilution
14. BV605 anti-CD24 (#101827 clone M1/69), 1/500 dilution
15. PerCP-Cy5.5 anti-CD43 (#143220 clone S11), 1/500 dilution
16. PE anti-CD21 (#123409 clone 7E9), 1/500 dilution
17. FITC anti-CD21 (#123407 clone 7E9), 1/500 dilution
18. PE-Cy7 anti-CD23 (#101614 clone B3B4), 1/500 dilution
19. PE anti-IgG1 (#406608 clone RMG1-1), 1/500 dilution
20. BV605 anti-IgG1 (#406629 clone RMG1-1), 1/500 dilution
21. APC anti-Ki67 (#652406 clone 16A8), 1/100 dilution
22. APC anti-BrdU (#364114 clone 3D4), 1/50 dilution
23. PE-Cy7 anti-IRF4 (#646413 clone IRF4. 3E4), 1/100 dilution
24. BV421 anti-PD-L2 (#107219 clone TY25), 1/100 dilution
25. PE anti-Sreptavidin (#405204), 1/500 dilution
26. PE-Cy7 anti-Sreptavidin (#405206), 1/500 dilution
27. BV605 anti-Sreptavidin (#405229), 1/500 dilution
28. BV421 anti-Sreptavidin (#405225), 1/500 dilution
29. APC-Cy7 anti-B220 (#103223 clone RA3-6B2), 1/500 dilution
30. Pacific Blue anti-GL7 (#144613 clone GL7), 1/500 dilution

From eBioscience

1. AF700 anti-B220 (#56-0452-82 clone RA3-6B2), 1/500 dilution
2. APC anti-B220 (#17-0452-82 clone RA3-6B2), 1/500 dilution
3. eF450 anti-B220 (#48-0452-82 clone RA3-6B2), 1/500 dilution
4. eF450 anti-CD86 (#48-0862-82 clone GL1), 1/500 dilution
5. eF450 anti-IgD (#48-5993-82 clone 11-26C (11-26)), 1/500 dilution
6. APC anti-CD93 (#17-5892-82 clone AA4.1), 1/500 dilution
7. APC-Cy7 anti-IgM (#47-5790-82 clone II/41), 1/500 dilution
8. PE anti-CD69 (#12-0691-81 clone H1.2F3), 1/500 dilution

From Invitrogen

1. FITC anti-Sreptavidin (#11-4317-87), 1/500 dilution
2. LIVE/DEAD Blue (#L34961), 1/1000 dilution
From Abcam
1. Anti-CGBP (CFP1) antibody (#ab198977)
2. Rabbit Anti-Mouse IgG H&L (#ab46540)
From proteintech
1. Beta Actin Monoclonal antibody (#66009-1-Ig), 1/5000 dilution
2. HRP-conjugated Goat Anti-Rabbit IgG(H+L) (#SA00001-2)
From Southern Biotech
1. Goat Anti-Mouse IgG1-HRP (#1071-05)
From Sigma Aldrich
1. Anti-trimethyl-Histone H3 (Lys4) (#07-473), 1/100 dilution
From Cell Signaling Technology
1. Anti-mouse IgG HRP-linked Antibody (#7076), 1/3000 dilution
2. Anti-Rpb1 CTD (4H8) antibody (#2629T), 1/100 dilution
3. Anti-tri-methyl-histone H3 (Lys27) (C36B11) antibody (9733T), 1/100 dilution
From Vector laboratories
1. Fluorescein anti-Peanut Agglutinin (PNA) (#FL-1071), 1/500 dilution
From R&D Systems
1. Mouse Ephrin-B1 Biotinylated Antibody (#BAF473), 1/100 dilution
From Antibodies Online
1. Anti-Rabbit IgG H&L antibody (#ABIN101961), 1/100 dilution

Validation

- From BD Biosciences
1. https://www.bdbiosciences.com/zh-cn/products/reagents/flow-cytometry-reagents/research-reagents/single-color-antibodies-ruo/purified-rat-anti-mouse-cd16-cd32-mouse-bd-fc-block.553142?tab=product_details
 2. https://www.bdbiosciences.com/zh-cn/products/reagents/flow-cytometry-reagents/research-reagents/single-color-antibodies-ruo/pe-hamster-anti-mouse-cd95.561985?tab=product_details
 3. https://www.bdbiosciences.com/zh-cn/products/reagents/flow-cytometry-reagents/research-reagents/single-color-antibodies-ruo/percp-cy-5-5-rat-anti-mouse-cd38.562770?tab=product_details
 4. https://www.bdbiosciences.com/zh-cn/products/reagents/flow-cytometry-reagents/research-reagents/single-color-antibodies-ruo/biotin-rat-anti-mouse-cd38.553762?tab=product_details
 5. https://www.bdbiosciences.com/zh-cn/products/reagents/flow-cytometry-reagents/research-reagents/single-color-antibodies-ruo/biotin-rat-anti-mouse-cd138.553713?tab=product_details
 6. https://www.bdbiosciences.com/zh-cn/products/reagents/flow-cytometry-reagents/research-reagents/single-color-antibodies-ruo/apc-cy-7-rat-anti-mouse-cd19.557655?tab=product_details
 7. https://www.bdbiosciences.com/zh-cn/products/reagents/flow-cytometry-reagents/research-reagents/single-color-antibodies-ruo/pe-mouse-anti-mouse-cd249-l-51.553735?tab=product_details
 8. https://www.bdbiosciences.com/zh-cn/products/reagents/flow-cytometry-reagents/research-reagents/single-color-antibodies-ruo/fitc-rat-anti-mouse-igm.553437?tab=product_details
 9. https://www.bdbiosciences.com/zh-cn/products/reagents/flow-cytometry-reagents/research-reagents/single-color-antibodies-ruo/biotin-rat-anti-mouse-igm.553436?tab=product_details
 10. https://www.bdbiosciences.com/zh-cn/products/reagents/flow-cytometry-reagents/research-reagents/single-color-antibodies-ruo/fitc-rat-anti-mouse-igg1.553443?tab=product_details
 11. https://www.bdbiosciences.com/zh-cn/products/reagents/flow-cytometry-reagents/research-reagents/single-color-antibodies-ruo/pe-rat-anti-mouse-igg1.550083?tab=product_details
 12. https://www.bdbiosciences.com/zh-cn/products/reagents/flow-cytometry-reagents/research-reagents/single-color-antibodies-ruo/bv421-rat-anti-mouse-igg1.742475?tab=product_details
 13. <https://www.bdbiosciences.com/zh-cn/products/reagents/flow-cytometry-reagents/research-reagents/single-color-antibodies-ruo/alexa-fluor-647-mouse-anti-bcl-6.561525>
 14. https://www.bdbiosciences.com/zh-cn/products/reagents/flow-cytometry-reagents/research-reagents/single-color-antibodies-ruo/bv605-hamster-anti-mouse-cd80.563052?tab=product_details
- From BioLegend
1. <https://www.biolegend.com/en-us/products/zombie-nir-fixable-viability-kit-8657>
 2. <https://www.biolegend.com/en-us/products/fitc-anti-mouse-human-gl7-antigen-t-and-b-cell-activation-marker-antibody-8284>
 3. <https://www.biolegend.com/en-us/products/pe-anti-mouse-cd95-fas-antibody-13907>
 4. <https://www.biolegend.com/en-us/products/apc-anti-mouse-cd95-fas-antibody-13906>
 5. <https://www.biolegend.com/en-us/products/apc-anti-mouse-cd184-cxcr4-antibody-9058>
 6. <https://www.biolegend.com/en-us/products/brilliant-violet-605-anti-mouse-cd184-cxcr4-antibody-14670>
 7. <https://www.biolegend.com/en-us/products/pe-cyanine7-anti-mouse-cd86-antibody-3046>
 8. <https://www.biolegend.com/en-us/products/brilliant-violet-510-anti-mouse-igd-9032>
 9. <https://www.biolegend.com/en-us/products/biotin-anti-mouse-igd-9573>
 10. <https://www.biolegend.com/en-us/products/pe-cyanine7-anti-mouse-cd38-antibody-3926>
 11. <https://www.biolegend.com/en-us/products/percp-cyanine5-5-anti-mouse-cd38-antibody-9563>
 12. <https://www.biolegend.com/en-us/products/pe-anti-mouse-cd138-syndecan-1-antibody-7519>
 13. <https://www.biolegend.com/en-us/products/brilliant-violet-421-anti-mouse-cd196-ccr6-antibody-7137>
 14. <https://www.biolegend.com/en-us/products/brilliant-violet-605-anti-mouse-cd24-antibody-9691>
 15. <https://www.biolegend.com/en-us/products/percp-cyanine5-5-anti-mouse-cd43-antibody-17488>
 16. <https://www.biolegend.com/en-us/products/pe-anti-mouse-cd21-cd35-cr2-cr1-antibody-4334>
 17. <https://www.biolegend.com/en-us/products/fitc-anti-mouse-cd21-cd35-cr2-cr1-antibody-4333>
 18. <https://www.biolegend.com/en-us/products/pe-cyanine7-anti-mouse-cd23-antibody-3941>
 19. <https://www.biolegend.com/en-us/products/pe-anti-mouse-igg1-6494>
 20. <https://www.biolegend.com/en-us/products/brilliant-violet-650-anti-mouse-igg1-antibody-14780>
 21. <https://www.biolegend.com/en-us/products/apc-anti-mouse-ki-67-antibody-8447>
 22. <https://www.biolegend.com/en-us/products/apc-anti-brdu-antibody-18137>

23. <https://www.biolegend.com/en-us/products/pe-cyanine7-anti-irf4-antibody-15526>
 24. <https://www.biolegend.com/en-us/products/brilliant-violet-421-anti-mouse-cd273-b7-dc-pd-l2-antibody-15573>
 25. <https://www.biolegend.com/en-us/products/pe-streptavidin-1475>
 26. <https://www.biolegend.com/en-us/products/pe-cyanine7-streptavidin-1477>
 27. <https://www.biolegend.com/en-us/products/brilliant-violet-605-streptavidin-7823>
 28. <https://www.biolegend.com/en-us/products/brilliant-violet-421-streptavidin-7297>
 29. <https://www.biolegend.com/en-us/products/apc-cyanine7-anti-mouse-human-cd45r-b220-antibody-1938>
 30. <https://www.biolegend.com/en-us/products/pacific-blue-anti-mouse-human-gl7-antigen-t-and-b-cell-activation-marker-antibody-9580>
 From eBioscience
 1. <https://www.thermofisher.cn/cn/zh/antibody/product/CD127-Antibody-clone-eBioRDR5-Monoclonal/56-0452-82>
 2. <https://www.thermofisher.cn/cn/zh/antibody/product/CD45R-B220-Antibody-clone-RA3-6B2-Monoclonal/17-0452-82>
 3. <https://www.thermofisher.cn/cn/zh/antibody/product/CD45R-B220-Antibody-clone-RA3-6B2-Monoclonal/48-0452-82>
 4. <https://www.thermofisher.cn/cn/zh/antibody/product/CD86-B7-2-Antibody-clone-GL1-Monoclonal/48-0862-82>
 5. <https://www.thermofisher.cn/cn/zh/antibody/product/IgD-Antibody-clone-11-26c-11-26-Monoclonal/48-5993-82>
 6. <https://www.thermofisher.cn/cn/zh/antibody/product/CD93-AA4-1-Antibody-clone-AA4-1-Monoclonal/17-5892-82>
 7. <https://www.thermofisher.cn/cn/zh/antibody/product/IgM-Antibody-clone-II-41-Monoclonal/47-5790-82>
 8. <https://www.thermofisher.cn/cn/zh/antibody/product/CD69-Antibody-clone-H1-2F3-Monoclonal/12-0691-81>
 From Invitrogen
 1. <https://www.thermofisher.cn/order/catalog/product/11-4317-87?SID=srch-hj-11-4317-87#/11-4317-87?SID=srch-hj-11-4317-87>
 2. <https://www.thermofisher.cn/order/catalog/product/L34961>
 From Abcam
 1. <https://www.abcam.cn/products/primary-antibodies/cgpb-antibody-epr19199-chip-grade-ab198977.html>
 2. <https://www.abcam.cn/products/secondary-antibodies/rabbit-mouse-igg-hl-ab46540.html>
 From proteintech
 1. <https://www.ptgcn.com/products/Pan-Actin-Antibody-66009-1-Ig.htm>
 2. <https://www.ptgcn.com/products/HRP-conjugated-Affinipure-Goat-Anti-Rabbit-IgG-H-L-secondary-antibody.htm>
 From Southern Biotech
 1. <https://www.southernbiotech.com/goat-anti-mouse-igg1-hrp-1071-05>
 From Sigma Aldrich
 1. <https://www.sigmaaldrich.com/HK/en/search/07-473?focus=products&page=1&perpage=30&sort=relevance&term=07-473&type=product>
 From Cell Signaling Technology
 1. <https://www.cellsignal.cn/products/secondary-antibodies/anti-mouse-igg-hrp-linked-antibody/7076>
 2. <https://www.cellsignal.cn/products/primary-antibodies/rpb1-ctd-4h8-mouse-mab/2629>
 3. <https://www.cellsignal.cn/products/primary-antibodies/tri-methyl-histone-h3-lys27-c36b11-rabbit-mab/9733>
 From Vector laboratories
 1. <https://vectorlabs.com/products/fluorescein-peanut-agglutinin-pna>
 From R&D Systems
 1. https://www.rndsystems.com/cn/products/mouse-ephrin-b1-biotinylated-antibody_baf473
 From Antibodies Online
 1. <https://www.antibodies-online.com/secondary-antibodies/101961/Guinea+Pig+anti-Rabbit+IgG+Heavy++Light+Chain+antibody+-+Preadsorbed>

Eukaryotic cell lines

Policy information about [cell lines and Sex and Gender in Research](#)

Cell line source(s)	40LB cells were kindly provided by Dr. Hai Qi (Tsinghua University, Beijing, China).
Authentication	40LB cells were not authenticated, but their function was validated in B cell activation and differentiation assays.
Mycoplasma contamination	The results of the Mycoplasma identification tests were all negative.
Commonly misidentified lines (See ICLAC register)	No commonly misidentified cell lines were used in this study.

Animals and other research organisms

Policy information about [studies involving animals](#); [ARRIVE guidelines](#) recommended for reporting animal research, and [Sex and Gender in Research](#)

Laboratory animals	C57BL/6J (000664, Jax) and Cd21-cre mice were originally from the Jackson Laboratory. The Aicda-cre were kind gifts from Dr. Xin He at Zhongshan School of Medicine, Sun Yat-sen University. And Cfp1-flox mice were kind gifts from Dr. Lie Wang at Zhejiang University School of Medicine.
Wild animals	The study did not involve wild animals.
Reporting on sex	Both male and female mice were used in the study.
Field-collected samples	The study did not include field-collected sample.
Ethics oversight	All animal experiments were carried out with approval from the Animal Care and Ethics Committee of Sun Yat-sen University (SYSU-)

Ethics oversight

IACUC). All mouse experiments were performed on 8-12 week old mice housed under specific-pathogen-free (SPF) conditions at 22 ± 1 °C and 50–60 % humidity with a 12 h light/dark cycle.

Note that full information on the approval of the study protocol must also be provided in the manuscript.

Plants

Seed stocks

N/A

Novel plant genotypes

N/A

Authentication

N/A

ChIP-seq

Data deposition

- ☒ Confirm that both raw and final processed data have been deposited in a public database such as [GEO](#).
- ☐ Confirm that you have deposited or provided access to graph files (e.g. BED files) for the called peaks.

Data access links

May remain private before publication.

H3K4me3 CUT&Tag have been deposited in NCBI GEO under the accession code GSE288059[<https://www.ncbi.nlm.nih.gov/geo/query/acc.cgi?acc=GSE288059>], Pol II&H3K27me3 CUT&Tag and CFP1 ChIP-seq have been deposited under the accession code PRJNA1283973 [<https://www.ncbi.nlm.nih.gov/bioproject/PRJNA1283973>] and PRJNA1273711 [<https://www.ncbi.nlm.nih.gov/bioproject/PRJNA1273711>]

Files in database submission

K4-GCB-WT1_R1.fq.gz
 K4-GCB-WT1_R2.fq.gz
 K4-GCB-WT2_R1.fq.gz
 K4-GCB-WT2_R2.fq.gz
 K4-GCB-WT3_R1.fq.gz
 K4-GCB-WT3_R2.fq.gz
 K4-GCB-KO1_R1.fq.gz
 K4-GCB-KO1_R2.fq.gz
 K4-GCB-KO2_R1.fq.gz
 K4-GCB-KO2_R2.fq.gz
 K4-GCB-KO3_R1.fq.gz
 K4-GCB-KO3_R2.fq.gz
 PolII-GCB-WT1_R1.fq.gz
 PolII-GCB-WT2_R1.fq.gz
 PolII-GCB-WT3_R1.fq.gz
 PolII-GCB-KO1_R1.fq.gz
 PolII-GCB-KO2_R1.fq.gz
 PolII-GCB-KO3_R1.fq.gz
 PolII-GCB-WT1_R2.fq.gz
 PolII-GCB-WT2_R2.fq.gz
 PolII-GCB-WT3_R2.fq.gz
 PolII-GCB-KO1_R2.fq.gz
 PolII-GCB-KO2_R2.fq.gz
 PolII-GCB-KO3_R2.fq.gz
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 H3K27me3-GCB-WT2_R1.fq.gz
 H3K27me3-GCB-WT3_R1.fq.gz
 H3K27me3-GCB-KO1_R1.fq.gz
 H3K27me3-GCB-KO2_R1.fq.gz
 H3K27me3-GCB-KO3_R1.fq.gz
 H3K27me3-GCB-WT1_R2.fq.gz
 H3K27me3-GCB-WT2_R2.fq.gz
 H3K27me3-GCB-WT3_R2.fq.gz
 H3K27me3-GCB-KO1_R2.fq.gz
 H3K27me3-GCB-KO2_R2.fq.gz
 H3K27me3-GCB-KO3_R2.fq.gz
 CFP1_Input1_R1.fq.gz
 CFP1_Input2_R1.fq.gz
 CFP1_Input3_R1.fq.gz
 CFP1_IP1_R1.fq.gz
 CFP1_IP2_R1.fq.gz

CFP1_IP3_R1.fq.gz
 CFP1_Input1_R2.fq.gz
 CFP1_Input2_R2.fq.gz
 CFP1_Input3_R2.fq.gz
 CFP1_IP1_R2.fq.gz
 CFP1_IP2_R2.fq.gz
 CFP1_IP3_R2.fq.gz

Genome browser session
 (e.g. [UCSC](#))

No longer applicable.

Methodology

Replicates	For each mark assessed, three biological replicates were performed.
Sequencing depth	All Barcoded libraries were pooled and sequenced on the DNBSEQ-T7 platform with 150 bp paired-end reads
Antibodies	anti-H3K4me3 antibody (07-473, Millipore) , Pol II antibody (Cell Signaling Technology, 2629T), anti-H3K27me3 antibody (Cell Signaling Technology, 9733), anti-CGBP (Abcam, ab198977)
Peak calling parameters	Alignments against the mm10 reference genome using BWA (version 0.7.17) and sorted BAM files were generated using samtools. peaks were called using MACS3 with p-values < 1e-5. The parameters are as follows: for i in *.nodup.bam;do macs3 callpeak -t \${i} -f BAM -g mm -n \${i%.nodup.bam} -B -p 1e-5 --broad-cutoff 1e-5 --max-gap 500 --nolambda --nomodel --keep-dup all --outdir ./ macs3_broad --broad 2>\${i%.nodup.bam}.macs3.broad.log;done
Data quality	We used Diffbind software to calculate differential peaks with FDR<0.05, the multiBigwigSummary feature of deepTools was used to calculate the RPKM values of H3K4me3 peaks for individual genes.
Software	Trim Galore (version 20.04.6), BWA (version 0.7.17), MACS3 (version 3.0.0a7), R(version 4.2.2), DiffBind(version 3.8.4),samtools (version 1.10.2), deepTools (version 3.5.1), IGV (version 2.18.2)

Flow Cytometry

Plots

Confirm that:

- ☐ The axis labels state the marker and fluorochrome used (e.g. CD4-FITC).
- ☐ The axis scales are clearly visible. Include numbers along axes only for bottom left plot of group (a 'group' is an analysis of identical markers).
- ☒ All plots are contour plots with outliers or pseudocolor plots.
- ☒ A numerical value for number of cells or percentage (with statistics) is provided.

Methodology

Sample preparation	Bone marrow cells and splenocytes were filtered through 40 or 70-µm cell strainers, respectively. RBCs were lysed by resuspending in 3 ml RBC Lysis Buffer (R1010-500, Solarbio) for 5 min on ice. Dead cells were excluded from analysis based on staining with Zombie Near IR (423106, Biolegend) in PBS for 30 min on ice, followed by Fc Block (553142, BD Biosciences) for 15 min and surface antibodies for 30 min in FACS buffer (PBS supplemented with 2% FBS and 2mM EDTA) on ice, Cells were stained with combinations of antibodies.
Instrument	Flowcytometry data were collected with Cytoflex/Cytoflex S Flow Cytometer (Beckman Coulter) .Cytek Arora, Cell sorting was performed using FACS Aria III Cell Sorter (BD)
Software	FlowJo software (Version 10.8.1), CytExpert (Version 2.3.1)
Cell population abundance	At least 10000 events were acquired for cells in the defined gate.
Gating strategy	The predominant cell population on a FSC/SSC plot was gated,and was further selected by comparing FSC-H and FSC-W to identify single cells.

- ☒ Tick this box to confirm that a figure exemplifying the gating strategy is provided in the Supplementary Information.