

Stanford



Caleb Lareau

Postdoctoral Research Fellow, Pathology

 Curriculum Vitae available Online

Bio

BIO

Caleb Lareau is currently a Stanford Science Fellow and Parker Scholar at Stanford University. He completed his PhD from Harvard Medical School where his dissertation concerned the development of new single-cell methods and technologies. His current work at Stanford concerns the development and application of new technologies and approaches to understand oncogenesis, including the earliest transformations of pre-malignant cells in tissues, and how we may be able to improve immunotherapies to fight these diseases.

HONORS AND AWARDS

- Parker Scholar, Parker Institute for Cancer Immunotherapy (2021)
- Stanford Science Fellow, Stanford University (2020)
- NIH Ruth L. Kirschstein National Research Service Award (F31), National Cancer Institute (2018)
- NSF GRFP, National Science Foundation (2015)
- DAAD Rise Fellow, Deutscher Akademischer Austauschdienst (2013, 2014)
- Barry M. Goldwater Scholar, Goldwater Foundation (2013)

PROFESSIONAL EDUCATION

- Doctor of Philosophy, Harvard University (2020)
- Master of Arts, Harvard University (2017)
- Bachelor of Science, University of Tulsa (2015)

STANFORD ADVISORS

- Ansuman Satpathy, Postdoctoral Faculty Sponsor

LINKS

- Twitter: <https://twitter.com/caleblareau>
- Github: <https://github.com/caleblareau>

Publications

PUBLICATIONS

- **STAG2 loss rewires oncogenic and developmental programs to promote metastasis in Ewing sarcoma.** *Cancer cell*
Adane, B., Alexe, G., Seong, B. K., Lu, D., Hwang, E. E., Hnisz, D., Lareau, C. A., Ross, L., Lin, S., Dela Cruz, F. S., Richardson, M., Weintraub, A. S., Wang, et al

2021; 39 (6): 827

- **Longitudinal single-cell dynamics of chromatin accessibility and mitochondrial mutations in chronic lymphocytic leukemia mirror disease history.** *Cancer discovery*
Penter, L., Gohil, S. H., Lareau, C., Ludwig, L. S., Parry, E. M., Huang, T., Li, S., Zhang, W., Livitz, D., Leshchiner, I., Parida, L., Getz, G., Rassenti, et al
2021
- **A microRNA expression and regulatory element activity atlas of the mouse immune system.** *Nature immunology*
Rose, S. A., Wroblewska, A., Dhainaut, M., Yoshida, H., Shaffer, J. M., Bektesevic, A., Ben-Zvi, B., Rhoads, A., Kim, E. Y., Yu, B., Lavin, Y., Merad, M., Buenrostro, et al
2021
- **Scalable, multimodal profiling of chromatin accessibility, gene expression and protein levels in single cells.** *Nature biotechnology*
Mimitou, E. P., Lareau, C. A., Chen, K. Y., Zorzetto-Fernandes, A. L., Hao, Y., Takeshima, Y., Luo, W., Huang, T., Yeung, B. Z., Papalexis, E., Thakore, P. I., Kibayashi, T., Wing, et al
2021
- **The neutrotime transcriptional signature defines a single continuum of neutrophils across biological compartments.** *Nature communications*
Grieshaber-Bouyer, R., Radtke, F. A., Cunin, P., Stifano, G., Levescot, A., Vijaykumar, B., Nelson-Maney, N., Blaustein, R. B., Monach, P. A., Nigrovic, P. A., ImmGen Consortium, Aguilar, O., Allan, R., et al
2021; 12 (1): 2856
- **Distinct Foxp3 enhancer elements coordinate development, maintenance, and function of regulatory T cells.** *Immunity*
Kawakami, R. n., Kitagawa, Y. n., Chen, K. Y., Arai, M. n., Ohara, D. n., Nakamura, Y. n., Yasuda, K. n., Osaki, M. n., Mikami, N. n., Lareau, C. A., Watanabe, H. n., Kondoh, G. n., Hirota, et al
2021
- **The SARS-CoV-2 RNA-protein interactome in infected human cells.** *Nature microbiology*
Schmidt, N., Lareau, C. A., Keshishian, H., Ganskih, S., Schneider, C., Hennig, T., Melanson, R., Werner, S., Wei, Y., Zimmer, M., Ade, J., Kirschner, L., Zielinski, et al
2020
- **Chromatin Potential Identified by Shared Single-Cell Profiling of RNA and Chromatin.** *Cell*
Ma, S., Zhang, B., LaFave, L. M., Earl, A. S., Chiang, Z., Hu, Y., Ding, J., Brack, A., Kartha, V. K., Tay, T., Law, T., Lareau, C., Hsu, et al
2020
- **Inherited myeloproliferative neoplasm risk affects haematopoietic stem cells.** *Nature*
Bao, E. L., Nandakumar, S. K., Liao, X., Bick, A. G., Karjalainen, J., Tabaka, M., Gan, O. I., Havulinna, A. S., Kiiskinen, T. T., Lareau, C. A., de Lapuente Portilla, A. L., Li, B., Emdin, et al
2020
- **The Polygenic and Monogenic Basis of Blood Traits and Diseases.** *Cell*
Vuckovic, D., Bao, E. L., Akbari, P., Lareau, C. A., Mousas, A., Jiang, T., Chen, M., Raffield, L. M., Tardaguila, M., Huffman, J. E., Ritchie, S. C., Megy, K., Ponstingl, et al
2020; 182 (5): 1214
- **Trans-ethnic and Ancestry-Specific Blood-Cell Genetics in 746,667 Individuals from 5 Global Populations.** *Cell*
Chen, M., Raffield, L. M., Mousas, A., Sakaue, S., Huffman, J. E., Moscati, A., Trivedi, B., Jiang, T., Akbari, P., Vuckovic, D., Bao, E. L., Zhong, X., Manansala, et al
2020; 182 (5): 1198
- **Epigenomic State Transitions Characterize Tumor Progression in Mouse Lung Adenocarcinoma.** *Cancer cell*
LaFave, L. M., Kartha, V. K., Ma, S., Meli, K., Del Priore, I., Lareau, C., Naranjo, S., Westcott, P. M., Duarte, F. M., Sankar, V., Chiang, Z., Brack, A., Law, et al
2020; 38 (2): 212
- **A dual-deaminase CRISPR base editor enables concurrent adenine and cytosine editing** *NATURE BIOTECHNOLOGY*
Grunewald, J., Zhou, R., Lareau, C. A., Garcia, S. P., Iyer, S., Miller, B. R., Langner, L. M., Hsu, J. Y., Aryee, M. J., Joung, J.
2020; 38 (7): 861–U27
- **Prioritizing disease and trait causal variants at the TNFAIP3 locus using functional and genomic features** *NATURE COMMUNICATIONS*
Ray, J. P., de Boer, C. G., Fulco, C. P., Lareau, C. A., Kanai, M., Ulirsch, J. C., Tewhey, R., Ludwig, L. S., Reilly, S. K., Bergman, D. T., Engreitz, J. M., Issner, R., Finucane, et al

2020; 11 (1): 1237

- **Inference and effects of barcode multiplets in droplet-based single-cell assays** *NATURE COMMUNICATIONS*
Lareau, C. A., Ma, S., Duarte, F. M., Buenrostro, J. D.
2020; 11 (1): 866
- **Control of human hemoglobin switching by LIN28B-mediated regulation of BCL11A translation** *NATURE GENETICS*
Basak, A., Munschauer, M., Lareau, C. A., Montbleau, K. E., Ulirsch, J. C., Hartigan, C. R., Schenone, M., Lian, J., Wang, Y., Huang, Y., Wu, X., Gehrke, L., Rice, et al
2020; 52 (2): 138-+
- **An old BATF's new T-ricks.** *Nature immunology*
Lareau, C. A., Satpathy, A. T.
2020
- **Purifying Selection against Pathogenic Mitochondrial DNA in Human T Cells.** *The New England journal of medicine*
Walker, M. A., Lareau, C. A., Ludwig, L. S., Karaa, A. n., Sankaran, V. G., Regev, A. n., Mootha, V. K.
2020
- **Massively parallel single-cell mitochondrial DNA genotyping and chromatin profiling.** *Nature biotechnology*
Lareau, C. A., Ludwig, L. S., Muus, C. n., Gohil, S. H., Zhao, T. n., Chiang, Z. n., Pelka, K. n., Verboon, J. M., Luo, W. n., Christian, E. n., Rosebrock, D. n., Getz, G. n., Boland, et al
2020
- **Single Cell Transcriptomics Implicate Novel Monocyte and T Cell Immune Dysregulation in Sarcoidosis.** *Frontiers in immunology*
Garman, L., Pelikan, R. C., Rasmussen, A., Lareau, C. A., Savoy, K. A., Deshmukh, U. S., Bagavant, H., Levin, A. M., Daouk, S., Drake, W. P., Montgomery, C. G.
2020; 11: 567342
- **Large-Scale Topological Changes Restrain Malignant Progression in Colorectal Cancer.** *Cell*
Johnstone, S. E., Reyes, A. n., Qi, Y. n., Adriaens, C. n., Hegazi, E. n., Pelka, K. n., Chen, J. H., Zou, L. S., Drier, Y. n., Hecht, V. n., Shores, N. n., Selig, M. K., Lareau, et al
2020
- **Longitudinal assessment of clonal mosaicism in human hematopoiesis via mitochondrial mutation tracking** *BLOOD ADVANCES*
Lareau, C. A., Ludwig, L. S., Sankaran, V. G.
2019; 3 (24): 4161-65
- **Activity-by-contact model of enhancer-promoter regulation from thousands of CRISPR perturbations** *NATURE GENETICS*
Fulco, C. P., Nasser, J., Jones, T. R., Munson, G., Bergman, D. T., Subramanian, V., Grossman, S. R., Anyoha, R., Doughty, B. R., Patwardhan, T. A., Nguyen, T. H., Kane, M., Perez, et al
2019; 51 (12): 1664-+
- **Assessment of computational methods for the analysis of single-cell ATAC-seq data** *GENOME BIOLOGY*
Chen, H., Lareau, C. A., Andreani, T., Vinyard, M. E., Garcia, S. P., Clement, K., Andrade-Navarro, M., Buenrostro, J. D., Pinello, L.
2019; 20 (1): 241
- **CRISPR DNA base editors with reduced RNA off-target and self-editing activities** *NATURE BIOTECHNOLOGY*
Grunewald, J., Zhou, R., Iyer, S., Lareau, C. A., Garcia, S. P., Aryee, M. J., Joung, J.
2019; 37 (9): 1041-+
- **Droplet-based combinatorial indexing for massive-scale single-cell chromatin accessibility** *NATURE BIOTECHNOLOGY*
Lareau, C. A., Duarte, F. M., Chew, J. G., Kartha, V. K., Burkett, Z. D., Kohlway, A. S., Pokholok, D., Aryee, M. J., Steemers, F. J., Lebofsky, R., Buenrostro, J. D.
2019; 37 (8): 916-+
- **Transcriptional States and Chromatin Accessibility Underlying Human Erythropoiesis** *CELL REPORTS*
Ludwig, L. S., Lareau, C. A., Bao, E. L., Nandakumar, S. K., Muus, C., Ulirsch, J. C., Chowdhary, K., Buenrostro, J. D., Mohandas, N., An, X., Aryee, M. J., Regev, A., Sankaran, et al
2019; 27 (11): 3228-+
- **Transcriptome-wide off-target RNA editing induced by CRISPR-guided DNA base editors** *NATURE*

- Grunewald, J., Zhou, R., Garcia, S. P., Iyer, S., Lareau, C. A., Aryee, M. J., Joung, J.
2019; 569 (7756): 433-+
- **Gene-centric functional dissection of human genetic variation uncovers regulators of hematopoiesis** *ELIFE*
Nandakumar, S. K., McFarland, S. K., Mateyka, L. M., Lareau, C. A., Ulirsch, J. C., Ludwig, L. S., Agarwal, G., Engreitz, J. M., Przychodzen, B., McConkey, M., Cowley, G. S., Doench, J. G., Maciejewski, et al
2019; 8
 - **Impaired human hematopoiesis due to a cryptic intronic GATA1 splicing mutation** *JOURNAL OF EXPERIMENTAL MEDICINE*
Abdulhay, N. J., Fiorini, C., Verboon, J. M., Ludwig, L. S., Ulirsch, J. C., Zieger, B., Lareau, C. A., Mi, X., Roy, A., Obeng, E. A., Erlacher, M., Gupta, N., Gabriel, et al
2019; 216 (5): 1050-60
 - **Heritability of fetal hemoglobin, white cell count, and other clinical traits from a sickle cell disease family cohort** *AMERICAN JOURNAL OF HEMATOLOGY*
Bao, E. L., Lareau, C. A., Brugnara, C., Fulcher, I. R., Barau, C., Moutereau, S., Habibi, A., Badaoui, B., Berkenou, J., Bartolucci, P., Galacteros, F., Platt, O. S., Mahaney, et al
2019; 94 (5): 522-27
 - **Single-cell trajectories reconstruction, exploration and mapping of omics data with STREAM** *NATURE COMMUNICATIONS*
Chen, H., Albergante, L., Hsu, J. Y., Lareau, C. A., Lo Bosco, G., Guan, J., Zhou, S., Gorban, A. N., Bauer, D. E., Aryee, M. J., Langenau, D. M., Zinovyev, A., Buenrostro, et al
2019; 10: 1903
 - **Novel CRISPR Cytosine Base Editors with Minimized Off-Target Effects and Improved Editing Properties**
Grunewald, J., Zhou, R., Garcia, S. P., Iyer, S., Lareau, C. A., Aryee, M. J., Joung, J.
CELL PRESS.2019: 295
 - **The ATPase module of mammalian SWI/SNF family complexes mediates subcomplex identity and catalytic activity-independent genomic targeting** *NATURE GENETICS*
Pan, J., McKenzie, Z. M., D'Avino, A. R., Mashtalir, N., Lareau, C. A., St Pierre, R., Wang, L., Shilatifard, A., Kadoch, C.
2019; 51 (4): 618-+
 - **Interrogation of human hematopoiesis at single-cell and single-variant resolution** *NATURE GENETICS*
Ulirsch, J. C., Lareau, C. A., Bao, E. L., Ludwig, L. S., Guo, M. H., Benner, C., Satpathy, A. T., Kartha, V. K., Salem, R. M., Hirschhorn, J. N., Finucane, H. K., Aryee, M. J., Buenrostro, et al
2019; 51 (4): 683-+
 - **Lineage Tracing in Humans Enabled by Mitochondrial Mutations and Single-Cell Genomics** *CELL*
Ludwig, L. S., Lareau, C. A., Ulirsch, J. C., Christian, E., Muus, C., Li, L. H., Pelka, K., Ge, W., Oren, Y., Brack, A., Law, T., Rodman, C., Chen, et al
2019; 176 (6): 1325-+
 - **The cis-Regulatory Atlas of the Mouse Immune System** *CELL*
Yoshida, H., Lareau, C. A., Ramirez, R. N., Rose, S. A., Maier, B., Wroblewska, A., Desland, F., Chudnovskiy, A., Mortha, A., Dominguez, C., Tellier, J., Kim, E., Dwyer, et al
2019; 176 (4): 897-+
 - **Preprocessing and Computational Analysis of Single-Cell Epigenomic Datasets.** *Methods in molecular biology (Clifton, N.J.)*
Lareau, C., Kangeyan, D., Aryee, M. J.
2019; 1935: 187-202
 - **A non-canonical SWI/SNF complex is a synthetic lethal target in cancers driven by BAF complex perturbation** *NATURE CELL BIOLOGY*
Michel, B. C., D'Avino, A. R., Cassel, S. H., Mashtalir, N., McKenzie, Z. M., McBride, M. J., Valencia, A. M., Zhou, Q., Bocker, M., Soares, L. M., Pan, J., Remillard, D. I., Lareau, et al
2018; 20 (12): 1410-+
 - **Enhancer histone-QTLs are enriched on autoimmune risk haplotypes and influence gene expression within chromatin networks** *NATURE COMMUNICATIONS*
Pelikan, R. C., Kelly, J. A., Fu, Y., Lareau, C. A., Tessneer, K. L., Wiley, G. B., Wiley, M. M., Glenn, S. B., Harley, J. B., Guthridge, J. M., James, J. A., Aryee, M. J., Montgomery, et al
2018; 9: 2905

- **Integrated Single-Cell Analysis Maps the Continuous Regulatory Landscape of Human Hematopoietic Differentiation** *CELL*
Buenrostro, J. D., Corces, M., Lareau, C. A., Wu, B., Schep, A. N., Aryee, M. J., Majeti, R., Chang, H. Y., Greenleaf, W. J.
2018; 173 (6): 1535–+
- **Heritability enrichment of specifically expressed genes identifies disease-relevant tissues and cell types** *NATURE GENETICS*
Finucane, H. K., Reshef, Y. A., Anttila, V., Slowikowski, K., Gusev, A., Byrnes, A., Gazal, S., Loh, P., Lareau, C., Shores, N., Genovese, G., Saunders, A., Macosko, et al
2018; 50 (4): 621–+
- **Response to "Unexpected mutations after CRISPR-Cas9 editing in vivo"** *NATURE METHODS*
Lareau, C. A., Clement, K., Hsu, J. Y., Pattanayak, V., Joung, J., Aryee, M. J., Pinello, L.
2018; 15 (4): 238–39
- **hichipper: a preprocessing pipeline for calling DNA loops from HiChIP data** *NATURE METHODS*
Lareau, C. A., Aryee, M. J.
2018; 15 (3): 155–56
- **diffloop: a computational framework for identifying and analyzing differential DNA loops from sequencing data** *BIOINFORMATICS*
Lareau, C. A., Aryee, M. J.
2018; 34 (4): 672–74
- **Common genes associated with antidepressant response in mouse and man identify key role of glucocorticoid receptor sensitivity** *PLOS BIOLOGY*
Carrillo-Roa, T., Labermaier, C., Weber, P., Herzog, D. P., Lareau, C., Santarelli, S., Wagner, K. V., Rex-Haffner, M., Harbich, D., Scharf, S. H., Nemeroff, C. B., Dunlop, B. W., Craighead, et al
2017; 15 (12): e2002690
- **A B Cell Regulome Links Notch to Downstream Oncogenic Pathways in Small B Cell Lymphomas** *CELL REPORTS*
Ryan, R. H., Petrovic, J., Rausch, D. M., Zhou, Y., Lareau, C. A., Kluk, M. J., Christie, A. L., Lee, W. Y., Tarjan, D. R., Guo, B., Donohue, L. H., Gillespie, S. M., Nardi, et al
2017; 21 (3): 784–97
- **An Epigenome-Guided Approach to Causal Variant Discovery in Autoimmune Disease**
Pelikan, R. C., Kelly, J. A., Fu, Y., Lareau, C., Wiley, G. B., Glenn, S., Aryee, M., Montgomery, C., Gaffney, P.
WILEY.2017
- **Dissecting hematopoietic and renal cell heterogeneity in adult zebrafish at single-cell resolution using RNA sequencing** *JOURNAL OF EXPERIMENTAL MEDICINE*
Tang, Q., Iyer, S., Lobbardi, R., Moore, J. C., Chen, H., Lareau, C., Hebert, C., Shaw, M. L., Neftel, C., Suva, M. L., Ceol, C. J., Bernards, A., Aryee, et al
2017; 214 (10): 2875–87
- **Confounding in ex vivo models of Diamond-Blackfan anemia** *BLOOD*
Ulirsch, J. C., Lareau, C., Ludwig, L. S., Mohandas, N., Nathan, D. G., Sankaran, V. G.
2017; 130 (9): 1165–68
- **Notch-Regulated Enhancers in B-Cell Lymphoma Activate MYC and Potentiate B-Cell Receptor Signaling**
Ryan, R. H., Petrovic, J., Rausch, D., Lareau, C., Lee, W., Donohue, L., Christie, A. L., Gillespie, S., Kluk, M. J., Nardi, V., Faryabi, R. B., Hochberg, E. P., Weinstock, et al
AMER SOC HEMATOLOGY.2016
- **Computationally Efficient Solutions for Functionalizing Common Variants in Three-Dimensional Models**
Lareau, C. A., DeWeese, C. F., White, B. C., McKinney, B. A., Montgomery, C. G.
WILEY-BLACKWELL.2015: 562
- **Fine mapping of chromosome 15q25 implicates ZNF592 in neurosarcoidosis patients** *ANNALS OF CLINICAL AND TRANSLATIONAL NEUROLOGY*
Lareau, C. A., Adrianto, I., Levin, A. M., Iannuzzi, M. C., Rybicki, B. A., Montgomery, C. G.
2015; 2 (10): 972–77