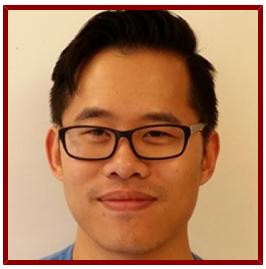
Stanford



Billy Tsz Cheong Lau

Instructor, Medicine - Oncology

Bio

ACADEMIC APPOINTMENTS

- Instructor, Medicine - Oncology

PROFESSIONAL EDUCATION

- B.A.Sc., University of British Columbia , Engineering Physics, Electrical Engineering Option (2006)
- Ph.D., Harvard University , Engineering Sciences (2012)

Publications

PUBLICATIONS

- **DNA conjugation on functionalized plastic surfaces for sequential, iterative single molecule sequencing.** *Scientific reports*
  Roy, S., Ji, H. P., Lau, B. T.
  2026
- **Single-cell aneuploidy and chromosomal arm imbalances define subclones with divergent transcriptomic phenotypes.** *NAR genomics and bioinformatics*
  Bai, X., Lau, B. T., Sathe, A., Grimes, S. M., Almeda-Nostine, A., Ji, H. P.
  2025; 7 (4): lqaf138
- **Multi-omics analysis of a pig-to-human decedent kidney xenotransplant.** *Nature*
  Schmauch, E., Piening, B. D., Dowdell, A. K., Mohebnasab, M., Williams, S. H., Stukalov, A., Robinson, F. L., Bombardi, R., Jaffe, I., Khalil, K., Kim, J., Aljabban, I., Eitan, et al
  2025
- **Cancer subclone detection based on DNA copy number in single-cell and spatial omic sequencing data.** *Nature methods*
  Wu, C. Y., Rong, J., Sathe, A., Hess, P. R., Lau, B. T., Grimes, S. M., Huang, S., Ji, H. P., Zhang, N. R.
  2025
- **Nanopore-based cell-free DNA fragmentation and methylation profiles from the cerebral spinal fluid of patients with lung cancer brain metastases.** *bioRxiv : the preprint server for biology*
  Chen, T., Bai, X., Burnside, G., Trinh, T. T., Gephart, M. H., Lau, B. T., Ji, H. P.
  2025
- **Single cell and spatial alternative splicing analysis with Nanopore long read sequencing.** *Nature communications*
  Fu, Y., Kim, H., Roy, S., Huang, S., Adams, J. I., Grimes, S. M., Lau, B. T., Sathe, A., Ji, H. P., Zhang, N. R.
  2025; 16 (1): 6654
- **Direct measurement of engineered cancer mutations and their transcriptional phenotypes in single cells.** *Nature biotechnology*
  Kim, H. S., Grimes, S. M., Chen, T., Sathe, A., Lau, B. T., Hwang, G. H., Bae, S., Ji, H. P.
  2023

- **Single-cell multi-gene identification of somatic mutations and gene rearrangements in cancer.** *NAR cancer*
  Grimes, S. M., Kim, H. S., Roy, S., Sathe, A., Ayala, C. I., Bai, X., Almeda-Notestine, A. F., Haebe, S., Shree, T., Levy, R., Lau, B. T., Ji, H. P.
  2023; 5 (3): zcad034
- **Magnetic DNA random access memory with nanopore readouts and exponentially-scaled combinatorial addressing.** *Scientific reports*
  Lau, B., Chandak, S., Roy, S., Tatwawadi, K., Wootters, M., Weissman, T., Ji, H. P.
  2023; 13 (1): 8514
- **Single-molecule methylation profiles of cell-free DNA in cancer with nanopore sequencing.** *Genome medicine*
  Lau, B. T., Almeda, A., Schauer, M., McNamara, M., Bai, X., Meng, Q., Partha, M., Grimes, S. M., Lee, H., Heestand, G. M., Ji, H. P.
  2023; 15 (1): 33
- **Single cell and spatial alternative splicing analysis with long read sequencing.** *Research square*
  Fu, Y., Kim, H., Adams, J. I., Grimes, S. M., Huang, S., Lau, B. T., Sathe, A., Hess, P., Ji, H. P., Zhang, N. R.
  2023
- **Tumor-associated microbiome features of metastatic colorectal cancer and clinical implications.** *Frontiers in oncology*
  An, H. J., Partha, M. A., Lee, H., Lau, B. T., Pavlichin, D. S., Almeda, A., Hooker, A. C., Shin, G., Ji, H. P.
  2023; 13: 1310054
- **Large Cancer Pedigree Involving Multiple Cancer Genes including Likely Digenic MSH2 and MSH6 Lynch Syndrome (LS) and an Instance of Recombinational Rescue from LS.** *Cancers*
  Vogelaar, I. P., Greer, S., Wang, F., Shin, G., Lau, B., Hu, Y., Haraldsdottir, S., Alvarez, R., Hazelett, D., Nguyen, P., Aguirre, F. P., Guindi, M., Hendifar, et al
  2022; 15 (1)
- **Colorectal cancer metastases in the liver establish immunosuppressive spatial networking between tumor associated SPP1+ macrophages and fibroblasts.** *Clinical cancer research : an official journal of the American Association for Cancer Research*
  Sathe, A., Mason, K., Grimes, S. M., Zhou, Z., Lau, B. T., Bai, X., Su, A., Tan, X., Lee, H., Suarez, C. J., Nguyen, Q., Poultsides, G., Zhang, et al
  2022
- **Germline variants of ATG7 in familial cholangiocarcinoma alter autophagy and p62.** *Scientific reports*
  Greer, S. U., Chen, J., Ogmundsdottir, M. H., Ayala, C., Lau, B. T., Delacruz, R. G., Sandoval, I. T., Kristjansdottir, S., Jones, D. A., Haslem, D. S., Romero, R., Fulde, G., Bell, et al
  2022; 12 (1): 10333
- **Reconstructing the spatial evolution of cancer through subclone detection on copy number profiles in tumor sequencing data.**
  Wu, C., Hess, P. R., Sathe, A., Rong, J., Lau, B. T., Grimes, S. M., Ji, H. P., Zhang, N. R.
  AMER ASSOC CANCER RESEARCH.2022
- **A single-cell solution for solid tumors to detect mutations and quantify copy number variations.**
  Wu, C., Hess, P. R., Sathe, A., Rong, J., Lau, B. T., Grimes, S. M., Ji, H. P., Zhang, N. R.
  AMER ASSOC CANCER RESEARCH.2022
- **Reconstructing the spatial evolution of cancer through subclone detection on copy number profiles in tumor sequencing data**
  Wu, C., Hess, P. R., Sathe, A., Rong, J., Lau, B. T., Grimes, S. M., Ji, H. P., Zhang, N. R.
  AMER ASSOC CANCER RESEARCH.2022
- **Analysis of 16S rRNA sequencing in advanced colorectal cancer tissue samples**
  An, H., Partha, M. A., Lee, H., Lau, B., Shin, G., Almeda, A., Ji, H. P.
  LIPPINCOTT WILLIAMS & WILKINS.2022
- **Single-cell characterization of CRISPR-modified transcript isoforms with nanopore sequencing.** *Genome biology*
  Kim, H. S., Grimes, S. M., Hooker, A. C., Lau, B. T., Ji, H. P.
  2021; 22 (1): 331
- **Integrative single-cell analysis of allele-specific copy number alterations and chromatin accessibility in cancer.** *Nature biotechnology*
  Wu, C., Lau, B. T., Kim, H. S., Sathe, A., Grimes, S. M., Ji, H. P., Zhang, N. R.
  2021

- **Profiling SARS-CoV-2 mutation fingerprints that range from the viral pangenome to individual infection quasispecies.** *Genome medicine*
  Lau, B. T., Pavlichin, D., Hooker, A. C., Almeda, A., Shin, G., Chen, J., Sahoo, M. K., Huang, C. H., Pinsky, B. A., Lee, H. J., Ji, H. P.
  2021; 13 (1): 62

- **Joint single cell DNA-seq and RNA-seq of gastric cancer cell lines reveals rules of in vitro evolution.** *NAR genomics and bioinformatics*
  Andor, N. n., Lau, B. T., Catalanotti, C. n., Sathe, A. n., Kubit, M. n., Chen, J. n., Blaj, C. n., Cherry, A. n., Bangs, C. D., Grimes, S. M., Suarez, C. J., Ji, H. P.
  2020; 2 (2): lqaa016

- **Profiling SARS-CoV-2 mutation fingerprints that range from the viral pangenome to individual infection quasispecies.** *medRxiv : the preprint server for health sciences*
  Lau, B. T., Pavlichin, D. n., Hooker, A. C., Almeda, A. n., Shin, G. n., Chen, J. n., Sahoo, M. K., Huang, C. n., Pinsky, B. A., Lee, H. n., Ji, H. P.
  2020

- **Single cell genomic characterization reveals the cellular reprogramming of the gastric tumor microenvironment.** *Clinical cancer research : an official journal of the American Association for Cancer Research*
  Sathe, A. n., Grimes, S. M., Lau, B. T., Chen, J. n., Suarez, C. n., Huang, R. J., Poultsides, G. A., Ji, H. P.
  2020

- **OVERCOMING HIGH NANOPORE BASECALLER ERROR RATES FOR DNA STORAGE VIA BASECALLER-DECODER INTEGRATION AND CONVOLUTIONAL CODES**
  Chandak, S., Neu, J., Tatwawadi, K., Mardia, J., Lau, B., Kubit, M., Hulett, R., Griffin, P., Wootters, M., Weissman, T., Ji, H., IEEE
  IEEE.2020: 8822–26

- **A high throughput method for the optimization of digital PCR assays for personalized circulating tumor DNA detection**
  Arce, M. M., Wood-Bouwens, C., Haslem, D., Lau, B. T., Bell, J., Almeda, A., Kubit, M., Moulton, B., Romero, R., St Onge, R. P., Nadauld, L., Ji, H. P.
  AMER ASSOC CANCER RESEARCH.2019

- **Comprehensive characterization of gastric cancer at single-cell resolution**
  Chen, J., Sathe, A., Grimes, S., Greer, S., Lau, B., Renschler, A., Poultsides, G., Suarez, C., Ji, H.
  AMER ASSOC CANCER RESEARCH.2019

- **Single cell RNA sequencing reveals multiple adaptive resistance mechanisms to regorafenib in colon cancer**
  Sathe, A., Lau, B. T., Grimes, S., Greer, S., Ji, H.
  AMER ASSOC CANCER RESEARCH.2019

- **A functional CRISPR/Cas9 screen identifies kinases that modulate FGFR inhibitor response in gastric cancer** *ONCOGENESIS*
  Chen, J., Bell, J., Lau, B. T., Whittaker, T., Stapleton, D., Ji, H. P.
  2019; 8

- **Single-cell transcriptome analysis identifies distinct cell types and niche signaling in a primary gastric organoid model.** *Scientific reports*
  Chen, J., Lau, B. T., Andor, N., Grimes, S. M., Handy, C., Wood-Bouwens, C., Ji, H. P.
  2019; 9 (1): 4536

- **Single-cell transcriptome analysis identifies distinct cell types and niche signaling in a primary gastric organoid model** *SCIENTIFIC REPORTS*
  Chen, J., Lau, B. T., Andor, N., Grimes, S. M., Handy, C., Wood-Bouwens, C., Ji, H. P.
  2019; 9

- **A functional CRISPR/Cas9 screen identifies kinases that modulate FGFR inhibitor response in gastric cancer.** *Oncogenesis*
  Chen, J. n., Bell, J. n., Lau, B. T., Whittaker, T. n., Stapleton, D. n., Ji, H. P.
  2019; 8 (5): 33

- **Improved read/write cost tradeoff in DNA-based data storage using LDPC codes**
  Chandak, S., Tatwawadi, K., Lau, B., Mardia, J., Kubit, M., Neu, J., Griffin, P., Wootters, M., Weissman, T., Ji, H., IEEE
  IEEE.2019: 147–56

- **Covalent 'click chemistry'-based attachment of DNA onto solid phase enables iterative molecular analysis.** *Analytical chemistry*
  Lau, B. T., Ji, H. P.
  2019

- **Integrated single-cell DNA and RNA analysis of intratumoral heterogeneity and immune lineages in colorectal and gastric tumor biopsies**
  Lau, B., Andor, N., Sathe, A., Wood-Bouwens, C., Poultsides, G., Ji, H.
  AMER ASSOC CANCER RESEARCH.2018
- **Characterization of colorectal liver metastasis at single-cell resolution reveals dynamic interplay in the tumor microenvironment**
  Sathe, A., Chen, J., Wood-Bouwens, C., Almeda, A., Lau, B., Grimes, S. M., Poultsides, G. A., Ji, H.
  AMER ASSOC CANCER RESEARCH.2018
- **Chromosome-scale haplotyping enables comprehensive discovery of cancer rearrangements and germline-related susceptibility mutations**
  Greer, S. U., Lau, B. T., Nadauld, L. D., Ji, H. P.
  AMER ASSOC CANCER RESEARCH.2018
- **High-quality CNV segments from low-coverage whole genome sequencing from FFPE cancer biopsies based on an evaluation of multiple CNV tools**
  Lee, H., Xia, L., Greer, S., Bell, J., Grimes, S. M., Bouwens, C., Shin, G., Lau, B. T. C., Johnson, L., Andor, N., Day, K., Miller, M., Escobar, et al
  AMER ASSOC CANCER RESEARCH.2018
- **Robust Multiplexed Clustering and Denoising of Digital PCR Assays by Data Gridding** *ANALYTICAL CHEMISTRY*
  Lau, B. T., Wood-Bouwens, C., Ji, H. P.
  2017; 89 (22): 11913–17
- **Chromosome-scale mega-haplotypes enable digital karyotyping of cancer aneuploidy** *NUCLEIC ACIDS RESEARCH*
  Bell, J. M., Lau, B. T., Greer, S. U., Wood-Bouwens, C., Xia, L. C., Connolly, I. D., Gephart, M. H., Ji, H. P.
  2017; 45 (19): e162
- **Single molecule counting and assessment of random molecular tagging errors with transposable giga-scale error-correcting barcodes** *BMC GENOMICS*
  Lau, B. T., Ji, H. P.
  2017; 18: 745
- **Single-Color Digital PCR Provides High-Performance Detection of Cancer Mutations from Circulating DNA.** *The Journal of molecular diagnostics : JMD*
  Wood-Bouwens, C., Lau, B. T., Handy, C. M., Lee, H., Ji, H. P.
  2017; 19 (5): 697-710
- **Single-Color Digital PCR Provides High-Performance Detection of Cancer Mutations from Circulating DNA** *JOURNAL OF MOLECULAR DIAGNOSTICS*
  Wood-Bouwens, C., Lau, B. T., Handy, C. M., Lee, H., Ji, H. P.
  2017; 19 (5): 697–710
- **CRISPR-Cas9-targeted fragmentation and selective sequencing enable massively parallel microsatellite analysis** *NATURE COMMUNICATIONS*
  Shin, G., Grimes, S. M., Lee, H., Lau, B. T., Xia, L. C., Ji, H. P.
  2017; 8
- **CRISPR-Cas9-targeted fragmentation and selective sequencing enable massively parallel microsatellite analysis** *NATURE COMMUNICATIONS*
  Shin, G., Grimes, S. M., Lee, H., Lau, B. T., Xia, L. C., Ji, H. P.
  2017; 8
- **Linked read sequencing resolves complex genomic rearrangements in gastric cancer metastases.** *Genome medicine*
  Greer, S. U., Nadauld, L. D., Lau, B. T., Chen, J. n., Wood-Bouwens, C. n., Ford, J. M., Kuo, C. J., Ji, H. P.
  2017; 9 (1): 57
- **Haplotyping germline and cancer genomes with high-throughput linked-read sequencing.** *Nature biotechnology*
  Zheng, G. X., Lau, B. T., Schnall-Levin, M., Jarosz, M., Bell, J. M., Hindson, C. M., Kyriazopoulou-Panagiotopoulou, S., Masquelier, D. A., Merrill, L., Terry, J. M., Mudivarti, P. A., Wyatt, P. W., Bharadwaj, et al
  2016; 34 (3): 303-311
- **Clonal structure analysis of cancer genomes at single molecule resolution**

Lau, B., Ji, H.
AMER ASSOC CANCER RESEARCH.2015

- **Megabase-scale phased haplotypes of genetic aberrations from whole cancer genome sequencing of primary colorectal tumors**
  Lau, B., Bell, J. M., Schnall-Levin, M., Jarosz, M., Hopmans, E., Wood, C. M., Zheng, G. X., Giorda, K., Ji, H. P.
  AMER ASSOC CANCER RESEARCH.2015
- **Megabase-scale phased haplotypes of genetic aberrations from whole cancer genome sequencing of primary colorectal tumors**
  Lau, B., Bell, J. M., Schnall-Levin, M., Jarosz, M., Hopmans, E., Wood, C. M., Zheng, G. X., Giorda, K., Ji, H. P.
  AMER ASSOC CANCER RESEARCH.2015
- **Highly sensitive and specific digital quantification of cancer genetic aberrations**
  Miotke, L. K., Lau, B., Rumma, R., Ji, H.
  AMER ASSOC CANCER RESEARCH.2014
- **A robust and rapid targeted sequencing technology for iterative multiple genomic features in cancer**
  Lau, B., Cushing, A., Ji, H.
  AMER ASSOC CANCER RESEARCH.2014
- **High sensitivity detection and quantitation of DNA copy number and single nucleotide variants with single color droplet digital PCR.** *Analytical chemistry*
  Miotke, L., Lau, B. T., Rumma, R. T., Ji, H. P.
  2014; 86 (5): 2618-2624
- **New quantitative methods for measuring plasmid loss rates reveal unexpected stability** *PLASMID*
  Lau, B. T. C., Malkus, P., Paulsson, J.
  2013; 70 (3): 353–61
- **A complete microfluidic screening platform for rational protein crystallization** *JOURNAL OF THE AMERICAN CHEMICAL SOCIETY*
  Lau, B. T. C., Baitz, C. A., Dong, X. P., Hansen, C. L.
  2007; 129 (3): 454–55