Bo Li

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Academic Employment

Jul. 2017 — present **Broad Institute of MIT and Harvard**

Postdoctoral Associate
Supervisor: Aviv Regev
Projects leading/co-leading:
1) Cloud-based single cell computational pipeline enabling analyzing millions of cells in days.
2) Immune cell atlas, collected 1.7 million immune cells from bone marrow, peripheral blood and cord blood.
3) Blood cell atlas, collaborated with Chloe, aiming at redefine cell types and markers in peripheral blood.
4) nuclei-hashing, multiplexing single nuclei using antibody-oligonucleotide conjugates.

Aug. 2013 — Jun. 2017 **University of California at Berkeley**
Postdoctoral Researcher
Supervisor: Lior Pachter

Education

Sept. 2008 — Jul. 2013 **University of Wisconsin–Madison**

Ph.D. in Computer Science
Thesis: "Computational analysis of RNA-Seq data in the absence of a known genome"
Advisor: Colin Dewey

Sept. 2004 — Jul. 2008 **Shanghai Jiao Tong University**
B.E. in Computer Science and Engineering (ACM Honor Class)

Representative Publications

1. **Li B**, Tambe A, Aviran S and Pachter L. PROBer provides a general toolkit for analyzing sequencing-based toeprinting assays. *Cell Systems*, 4(5):568–574, 2017.

   This paper describes PROBer – the first unified probabilistic framework for the analysis of a diverse set of sequencing-based 'toeprinting' assays. These assays are used to probe RNA secondary structure (DMS/SHAPE-Seq), detect epitranscriptomic mark (Pseudo-Seq), or identify RNA-protein interaction (iCLIP/eCLIP), which are important to understanding post-transcriptional gene regulation from all aspects.

2. **Li B***, Fillmore N*, Bai Y, Collins M, Thomson JA, Stewart R and Dewey CN. Evaluation of *de novo* transcriptome assemblies from RNA-Seq data. *Genome Biology*, 15(12):553, 2014. Highly accessed. (* Equal contribution, Citation: **133**)

   This paper describes the first principled method for evaluating de novo transcriptome assemblies without ground truth.

Representative Publications (continued)

3. **Li B** and Dewey CN. RSEM: Accurate transcript quantification from RNA-Seq data with or without a reference genome. *BMC Bioinformatics*, 12:323, 2011. Highly accessed. (Citation: **4,104**)

   This paper describes the RSEM software – a widely-used RNA-Seq transcript quantification tool that is actively serving in nationwide projects such as ENCODE (The Encyclopedia of DNA Elements) and TCGA (The Cancer Genome Altas).

4. **Li B**, Ruotti V, Stewart RM, Thomson JA and Dewey CN. RNA-Seq gene expression estimation with read mapping uncertainty. *Bioinformatics*, 26(4):493–500, 2010. (Citation: **604**)

   This paper describes the RSEM algorithm.

Other Publications

1. Choudhary K, Shih NP, Deng F, Ledda M, **Li B** and S. Aviran. Metrics for rapid quality control in RNA structure probing experiments. *Bioinformatics*, 32(23):3575–3583, 2016.

2. Zeng X, **Li B**, Welch R, Rojo C, Zheng Y, Dewey CN and Keleş S. Perm-seq: Mapping protein-DNA interactions in segmental duplication and highly repetitive regions of genomes with prior-enhanced read mapping. *PLoS Computational Biology*, 11(10):e1004491, 2015.

3. Haas B, Papanicolaou A, Yassour M, Grabherr M, Blood PD, Bowden J, Couger MB, Eccles D, **Li B**, Lieber M, MacManes MD, Ott M, Orvis J, Pochet N, Strozzi F, Weeks N, Westerman R, William T, Dewey CN, Henschel R, LeDuc RD, Friedman N and Regev A. *De novo* transcript sequence reconstruction from RNA-seq using the Trinity platform for reference generation and analysis. *Nature Protocols*, 8(8):1494–1512, 2013. (Citation: **2,260**)

   This paper describes the widely-used Trinity de novo transcriptome assembly pipeline. RSEM contributes to the pipeline as its transcript quantification tool.

4. Chung D, Kuan PF, **Li B**, Sanalkumar R, Liang K, Bresnick EH, Dewey C and Keleş S. Discovering transcription factor binding sites in highly repetitive regions of genomes with multi-read analysis of ChIP-Seq data. *PLoS Computational Biology*, 7(7):e1002111, 2011.

   This paper describes CSEM, one of the first ChIP-Seq multi-mapping read allocators. This work was highlighted in Nature Reviews Genetics.

Invited Talks

Assistant professor job talk, Department of Computer Science, Duke University, Durham, NC, USA. *Taming Big Sequencing Data for RNA Biology: From Transcript Abundance Estimation to 'Epitranscriptomic' Mark Detection.* (04/2017)

Assistant professor job talk, Department of Computer Science, University of Illinois at Urbana–Champaign, Urbana, IL, USA. *Taming Big Sequencing Data for RNA Biology: From Transcript Abundance Estimation to 'Epitranscriptomic' Mark Detection.* (03/2017)

Research assistant professor job talk, Toyota Technological Institute at Chicago, Chicago, IL, USA. *Taming Big Sequencing Data for RNA Biology: From Transcript Abundance Estimation to 'Epitranscriptomic' Mark Detection.* (02/2017)

The Center for RNA System Biology (CRSB) 4th Annual & Advisory Meeting with Poster Session, Berkeley, CA, USA. *PROBer: A General Toolkit for Analyzing Sequencing-based 'Toeprinting' Assays.* (10/2016)

RNA 2016: The 21st Annual Meeting of the RNA Society, Kyoto, Japan. *PROBer: A General Toolkit for Analyzing Sequencing-based 'Toeprinting' Assays.* (06/2016)

Invited Talks (continued)

NGS Data Analysis and Informatics Conference, San Diego, CA, USA. *Quantifying RNA Information from Transcriptome-wide Chemical Probing Experiments.* (02/2016)

Core Skills in Computational Biology, Center for Computational Biology, UC Berkeley, Berkeley, CA, USA. *RNA-Seq Transcript Quantification with RSEM: A Detailed Tutorial with Common Use Cases.* (11/2015)

Teaching
University of Wisconsin–Madison

Department of Biostatistics & Medical Informatics

Fall 2008   **Teaching Assistant**, Introduction to Bioinformatics
Introducing classic computational biology algorithms for undergraduates. Responsible for office hour, homework & exam grading, and test case design for programming assignments.

Shanghai Jiao Tong University
Department of Computer Science and Engineering

Spring 2007   **Teaching Assistant**, Design and Implementation of Modern Compilers
Helping computer science majors to implement a compiler from scratch for the Tiger language. Responsible for lecturing and final project grading.

Fall 2006   **Instructor**, Programming Bootcamp: Data Structures and Algorithms
Helping computer science majors to learn data structures and algorithms by solving programming challenges. Responsible for course design, lecturing, and assignment & exam grading.

Honors and Awards
2013   Finalist, Lane Fellows in Computational Biology, Carnegie Mellon University

2010 — 2012   Morgridge Institute for Research support for senior graduate students in Computation and Informatics in Biology and Medicine

2008   Alumni Scholarship, Computer Sciences Department, University of Wisconsin–Madison

Professional Service
Reviewer: BMC Bioinformatics, Bioinformatics, and Nucleic Acids Research

Program Committee: RECOMB-Seq 2016, IJCAI 2016