

# Dechao Tian

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<https://tian-dechao.github.io>

## Current Employment

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**ORISE Fellow** 2019 - Present  
*Center for Disease Control and Prevention*

- Surveillance, Information Management, and Statistics Office - Statistics and Machine Learning: research on anomaly cluster detection using genome sequencing data and linked epidemiological data

## Past Employment

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**Postdoctoral Research Associate** 2015 - 2019  
*Carnegie Mellon University*

- Computational Biology Department, Ma Laboratory - Computational Genomics: research on regulatory network, systems biology, and 3D chromatin organization

## Education

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**Ph.D. in Statistics and Applied Probability** 2010 - 2015  
*National University of Singapore, Singapore*  
Thesis title: Biological Network Analysis and Comparison  
Thesis advisor: Dr. Kwok Pui Choi

**M.S. in Probability and Mathematical Statistics** 2009 - 2011  
*Northeast Normal University, China*  
Thesis title: Random Network Models' Discrimination  
Thesis advisor: Dr. Zhidong Bai

**B.S. in Mathematics and Applied Mathematics** 2005 - 2009  
*Northeast Normal University, China*

## Manuscripts in Preparation

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3. **Tian D\***, Zhang R\*, Zhang Y, and Ma J, MOCHI enables discovery of heterogeneous interactome modules in 3D nucleome. bioRxiv, doi: <https://doi.org/10.1101/542092>. Resubmitted to *Genome Research*.
2. **Tian D\***, Zhu X\*, and Ma J, Diffdomains: random matrix theory supported identification of significantly reshaped chromatin domains from Hi-C contact matrices between normal and disease conditions.

1. **Tian D** and Ma J, Exploiting the interplay between chromatin interactome and transcriptional regulatory network.

## Publications

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9. **Tian D**, Gu Q and Ma J, Identifying gene regulatory network rewiring using latent differential graphical models, *Nucleic Acids Research* **44**, 17 (2016).
8. Koh V, Cheung C, Li X, **Tian D**, Wang J.J, Mitchell P, Cheng C.Y, and Wong T.T, Retinal vein occlusion in a multi-ethnic asian population: the singapore epidemiology of eye disease study, *Ophthalmic Epidemiology* **23**, 1 (2016).
7. Chen L, Cheng C.Y, Choi H, Ikram M.K, Sabanayagam C, Tan G.S, **Tian D**, Zhang L, Venkatesan G, Tai E.S, Wang J.J, Mitchell P, Cheung C.M.G, Beuerman R.W, Zhou L, Chan E.C.Y, Wong T.T, Plasma metabonomic profiling of diabetic retinopathy, *Diabetes* **65**, 4 (2016).
6. Yam G.H.F, Yusoff N.Z.B.M, Kadaba A, **Tian D**, Myint H.H, Beuerman R.W, Zhou L, Mehta J.S, Ex vivo propagation of human corneal stromal “activated keratocytes” for tissue engineering, *Cell Transplantation* **24**, 9 (2015).
5. Chen L, Li J, Guo T, Ghosh S, Koh S.K, **Tian D**, Zhang L, Jia D, Beuerman R.W, Aebersold R, Chan E.C.Y, Zhou L, Global metabonomic and proteomic analysis of human conjunctival epithelial cells (IOBA-NHC) in response to hyperosmotic stress, *Journal of Proteome Research* **14**, 9 (2015).
4. Tong L, Zhou X, Jylha A, Aapola U, Liu D.N, Koh S.W, **Tian D**, Quah J, Uusitalo H, Beuerman R.W, Zhou L, Quantitation of 47 human tear proteins using high resolution multiple reaction monitoring (HR-MRM) based-mass spectrometry, *Journal of Proteomics* **115**, (2015).
3. Zhang S\*, **Tian D\***, Tran N.H, Choi K.P, and Zhang L.X, Profiling human cell-type specific transcription factor regulatory networks, *Nucleic Acids Research* **42**, 20 (2014).
2. Barathi V.A, Chaurasia S.S, Poidinger M, Koh S.K, **Tian D**, Ho C, Iuvone P.M, Beuerman R.W, Zhou L, Involvement of GABA transporters in atropine-treated myopic retina as revealed by iTRAQ quantitative proteomics, *Journal of Proteome Research* **13**, 11 (2014).
1. **Tian D** and Choi K.P, Sharp bounds and normalization of wiener-type indices, *PLOS ONE* **8**, 11 (2013).

Note: ★ represents co-first authors.

## Research Experience

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3. **National University of Singapore, Singapore** 2014 - 2015  
*Research Assistant. Advisor: Kwok Pui Choi, Ph.D.*
  - Develop model to identify essential genes by network motifs in regulatory networks

2. **Singapore Eye Research Institute (SERI), Singapore** 2011 - 2015  
*Research Collaborator with Lei Zhou, Ph.D.*
  - Provide statistical analysis and consultation for Proteomics & Microanalysis Laboratory
  - Collaborate with other members from SERI
1. **Center for Quantitative Medicine, Duke-NUS, Singapore** 2012 - 2015  
*Associate Member*

## Teaching Assistant

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Introduction to R  
ST1131 Introduction to Statistics  
ST1232 Statistics for Life Science  
ST2131 Probability

## Skills

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### Programming (Most used first)

R, Python, Unix/Linux bash script command, SAS programming language (Certified Base Programmer for SAS 9)

### Bioinformatics tools & databases

MEME Suite, bedtools, Jvarkit, UCSC Genome Browser, ENCODE, TCGA

## Presentation

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1. DRIVE: an open source web application using Data Reduction for Interactive Visualization and Analysis of Epidemiologic and Genomic Data , DataViz day, CDC, 2019

## Posters

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3. Advanced Molecular Detection day, CDC, 2019
2. Systems Biology, Global Regulation & Gene Expression, CSHL, 2018
1. 4DN Annual Meeting, NIH, 2017

## References

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### Jian Ma, Ph.D.

Associate Professor, Computational Biology

Carnegie Mellon University

#### Contact Information

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**Zhidong Bai, Ph.D.**

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