Dechao Tian

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Research Interests

- Machine learning application in biomedicine and precision health
- Statistical modeling for data science
- Computational biology, systems biology, and genomics

Current Employment

Mathematical Statistician 2019 - Present
Centers for Disease Control and Prevention, US

- Develop solid statistical models to detect anomaly clusters using integrated whole-genome sequencing data and epidemiologic data in precision health

Education and Training

Postdoctoral Fellow in Computational Biology 2015 - 2019
Carnegie Mellon University, US
Advisor: Dr. Jian Ma

Ph.D. in Statistics and Applied Probability 2010 - 2015
National University of Singapore, Singapore
Advisor: Dr. Kwok Pui Choi

M.S. in Probability and Mathematical Statistics 2009 - 2011
Northeast Normal University, China
Advisor: Dr. Zhidong Bai

B.S. in Mathematics and Applied Mathematics 2005 - 2009
Northeast Normal University, China
Advisor: Dr. Jianhua Guo

Publications

* represents co-first authors

10. **Tian D***, Zhang R*, Zhang Y, Zhu X, and Ma J. MOCHI enables discovery of heterogeneous interactome modules in 3D nucleome, **Genome Research** 30, 2 (2020).

- Featured cover article
- Reported by Carnegie Mellon University. Exploring a genome's 3D organization through a social network lens, **Phys.org** February 20, 2020

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).

Manuscripts in Preparation

2. **Tian D**, Zhu X, and Ma J. Diffdomain enables detection of reshaped chromatin domains using random matrix theory.

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

Research Experience

4. **Carnegie Mellon University, US** 2015 - 2019

   Postdoctoral Fellow. Advisor: Jian Ma, Ph.D.

   - Develop advanced statistical and machine learning algorithms to study the interplay between three-dimensional genome architecture and gene regulation in disease

3. **National University of Singapore, Singapore** 2014 - 2015

   Research Assistant. Advisor: Kwok Pui Choi, Ph.D.

   - Develop machine learning algorithms to identify essential genes using 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 Experience

2. **Centers for Disease Control and Prevention, US** 2019

   Lecture on *Introduction to R*

1. **National University of Singapore, Singapore** 2010 - 2014

   Teaching assistant for *Introduction to Statistics*, *Statistics for Life Science*, and *Probability*

Presentations

2. **Centers for Disease Control and Prevention**, *DRIVE: an open source web application using Data Reduction for Interactive Visualization and Analysis of Epidemiologic and Genomic Data*, DataViz day, Atlanta, GA, 2019

1. **The Jackson Laboratory**, *Regulatory network inference and comparison*, Farmington, CT, 2018

References

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