Chengzhe Tian, Ph.D.

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Education

Ph.D. in Biophysics, University of Copenhagen, Denmark   **2017**
Thesis Title: *Decision Making in Biological Systems*
Thesis Advisor: Prof. Namiko Mitarai, Prof. Kim Sneppen
Defense Date: 2017.03.31; Award Date: 2017.04.03.

M.Sc. in Computational Biology and Bioinformatics (with distinction), ETH Zurich   **2013**
and University of Zurich, Switzerland
Thesis Title: *Extend Network Motifs with Monotone Systems*
Thesis Advisor: Dr. Hans-Michael Kaltenbach, Prof. Joerg Stelling

B.Sc. in Chemistry, Peking University, China   **2011**
B.Sc. in Computer Software, Peking University, China   **2011**
Thesis Title: *Analysis of Protein Configuration with Kirkwood-Buff Theory*
Thesis Advisor: Prof. Yi-Qin Gao

Research Experience

Junior Professor, University of Stuttgart   **2023.08-Present**

Project Scientist, Research Center for Molecular Medicine of the Austrian   **2022.04-2023.05**
Academy of Sciences (CeMM) and the RESOLUTE Consortium
Advisor: Prof. Giulio Superti-Furga
Area of study: *Deorphanize solute carriers by integrating multi-omics and imaging datasets*
- Analyze large-scale transcriptomics and metabolomics datasets to dissect the functions of solute carriers.
- Analyze large-scale imaging datasets to identify the subcellular localization of solute carriers.

Postdoctoral Associate, University of Colorado Boulder   **2017.06-2022.03**
Advisor: Prof. Sabrina Spencer
Area of study: *Proliferation-quiescence decision in cancer cells under oncogenic inhibition*
- Measure the proliferation-quiescence responses of single cancer cells using time-lapse microscopy and fluorescent live-cell reporters.
- Perform cell-biology experiments, including mammalian cell culture, immunofluorescence, and RNA FISH.
- Develop algorithms to analyze microscopy and single-cell RNA-sequencing datasets.

Ph.D. Student, University of Copenhagen   **2014.02-2017.01**
Advisor: Prof. Namiko Mitarai, Prof. Kim Sneppen
Area of study: *Mathematical modeling of bacterial antibiotic responses*
- Construct ODE-based mathematical models to describe the stochastic switching of the Toxin-Antitoxin systems and its relationship with bacterial antibiotic persistence.
- Work closely with the experimental collaborators for experimental design and interpretation.

Research Assistant, ETH Zurich 2013.09-2014.01

Advisor: Prof. Savas Tay

Area of study: *Single-cell heterogeneity of immune signaling*

- Construct ODE-based mathematical models to describe the single-cell heterogeneity of the mammalian NF-kB pathway upon immunological stimulation
- Work closely with the experimental collaborators for experimental design and interpretation.

Publication

1. J.Y. Chen, C. Hug, J. Reyes, **C. Tian**, L. Gerosa, F. Fröhlich, B. Ponsioen, H.J.G. Snippert, S.L. Spencer, A. Jambhekar, P.K. Sorger, G. Lahav. Multi range ERK responses shape the proliferative trajectory of single cells following oncogene induced senescence. *Cell. Rep.* **42**: 112252 (2023).

2. C. Yang,* **C. Tian**,* T. Hoffman,* N. Jacobsen, S. Spencer. Melanoma subpopulations that rapidly escape MAPK pathway inhibition incur DNA damage and rely on stress signalling. *Nat. Commun.* **12**: 1747 (2021). (*: equal contribution)

3. **C. Tian**,* C. Yang,* S. Spencer. EllipTrack: a global-local cell-tracking pipeline for 2D fluorescence time-lapse microscopy. *Cell. Rep.* **32**: 107984 (2020).

4. M. Min, Y. Rong, **C. Tian**, S. Spencer. Temporal integration of mitogen history in mother cells controls proliferation of daughter cells. *Science.* **368**: aay8241 (2020).

5. R. Fu, A. Gillen, R. Sheridan, **C. Tian**, M. Daya, Y. Hao, J. Hesselberth, K. Riemondy. clustifyr: An R package for automated single-cell RNA sequencing cluster classification. *F1000Res.* **9**: 223 (2020).

6. S. Fourati, A. Talla, M. Mahmoudian, J.G. Burkhart, R. Klén, R. Henao, T. Yu, Z. Aydın, K.Y. Yeung, M.E. Ahsen, R. Almugbel, S. Jahandideh, X. Liang, T.E.M. Nordling, M. Shiga, A. Stanescu, R. Vogel, **Respiratory Viral DREAM Challenge Consortium**, G. Pandey, C. Chiu, M.T. McClain, C.W. Woods, G.S. Ginsburg, L.L. Elo, E.L. Tsalik, L.M. Mangravite, S.K. Sieberts. A crowdsourced analysis to identify ab initio molecular signatures predictive of susceptibility to viral infection. *Nat. Commun.* **9**: 4418 (2018).

7. I. Miller, M. Min, C. Yang, **C. Tian**, S. Gookin, D. Carter, S. Spencer. Ki67 is a Graded Rather than a Binary Marker of Proliferation versus Quiescence. *Cell. Rep.* **24**: 1105-1112 (2018).

8. **C. Tian**, S. Semsey, N. Mitarai. Synchronized switching of multiple Toxin–Antitoxin modules by (p) ppGpp fluctuation. *Nucleic. Acids. Res.* **45**: 8180-8189 (2017).

9. R.A. Kellogg,* **C. Tian**,* M. Etzrodt, S. Tay. Cellular Decision Making by Non-Integrative Processing of TLR Inputs. *Cell. Rep.* **19**: 125-135 (2017).

10. **C. Tian**,* M. Roghanian,* M.G. Jorgensen, K. Sneppen, M.A. Sørensen, K. Gerdes, N. Mitarai. Rapid curtailing of the stringent response by Toxin-Antitoxin-encoded mRNases. *J. Bacteriol.* **198**: 1918-1926 (2016).

11. **C. Tian**, N. Mitarai. Bifurcation of transition paths induced by coupled bistable systems. *J. Chem. Phys.* **144**: 215102 (2016).

12. R.A. Kellogg, **C. Tian**, T. Lipniacki, S.R. Quake, S. Tay. Digital signaling decouples activation probability and population heterogeneity. *eLife* **4**: e08931 (2015).

13. H. Zhang, M. Lin, H. Shi, W. Ji, L. Huang, X. Zhang, S. Shen, R. Gao, S. Wu, **C. Tian**, Z. Yang, G. Zhang, S. He, H. Wang, T. Saw, Y. Chen, Q. Ouyang. Programming a Pavlovian-like conditioning circuit in Escherichia coli. *Nat. Commun.* **5**:3102 (2014).

Teaching Experience

Instructor, Short-Read Sequencing Workshop, University of Colorado Boulder	2019.07
Teaching Assistant, Numerical Methods in Physics, University of Copenhagen	2015.07
Teaching Assistant, Biological Dynamics, University of Copenhagen	2015.04-2015.06
Teaching Assistant, Dynamical Systems and Chaos, University of Copenhagen	2015.02-2015.04
Teaching Assistant, Instrumental Analysis Laboratory, Peking University	2011.02-2011.06

Selected Talks

C. Tian, C. Yang, T. Hoffman, N. Jacobsen, S. Spencer. Signaling adaptation mediates rapid escape from BRAF inhibition in single melanoma cells. Cell Bio Virtual 2020 (ASCB and EMBO Annual Meeting), Virtual	2020.11
C. Tian, C. Yang, T. Hoffman, N. Jacobsen, S. Spencer. Signaling adaptation mediates rapid escape from BRAF inhibition in single melanoma cells. From Functional Genomics to Systems Biology, EMBL, Virtual	2020.10
C. Tian, C. Yang, S. Spencer. A "global tracker" for hard-to-track cancer cells reveals substantial heterogeneity in the dynamics of single-cell drug responses. Single Cell Biology, Keystone Symposia on Molecular and Cellular Biology, Breckenridge, Colorado, USA	2019.01

Poster Presentations

C. Tian, C. Yang, T. Hoffman, N. Jacobsen, S. Spencer. Signaling plasticity mediates rapid escape from BRAF inhibition in single melanoma cells. Cancer Evolution and Combinatorial Cancer Therapies: Concepts and Challenges, Keystone Symposia on Molecular and Cellular Biology, Banff, Alberta, Canada	2020.01
C. Tian, S. Spencer. A cell tracking pipeline for time-lapse imaging of cancer cells. Salk Cell Cycle Meeting, Salk Institute, San Diego, California, USA	2018.07
C. Tian, N. Mitarai, Bifurcation of transition paths induced by coupled bistable systems. qBio Conference, Nashville, Tennessee, USA	2016.07
C. Tian, N. Mitarai, Bifurcation of transition paths induced by coupled bistable systems. Dynamics and Information Processing: from Cells to Tissues, Les Houches, Auvergne-Rhône-Alpes, France	2016.02
C. Tian, H. Kaltenbach, J. Stelling. Extend network motifs by monotone systems. Physics of Biology, Geneva, Switzerland	2013.10

Award

Marie-Curie Postdoctoral Fellowship (Awarded but declined; Score: 96/100)	2022.03
Conference Fellowship, EMBL Advanced Training Centre Corporate Partnership Programme	2020.11
Meritorious Winner, Mathematical Contest in Modeling	2011.02
Robin Lee Scholarship	2010.10
National First Prize, Chinese Undergraduate Mathematical Contest in Modeling	2010.09
Gold Medal, International Genetically Engineered Machine (iGEM) Competition	2009.11
May 4th Scholarship	2009.10
Starlight International Media Scholarship, 3rd Prize	2008.10

Academic Services

Manuscript Peer Review
- Direct requests from the editors: Cell Reports Methods, Annals of Applied Statistics, and PLoS One.
- In collaboration with my supervisors: Biophysical Journal, Cell Systems, eLife, PLoS Computational Biology, and Nature Communications.

Supervision

Nicole Jacobsen, Research Assistant and Honor Bachelor Thesis, University of Colorado Boulder	2018.01-2019.07
Philip Benson, Ph.D. Lab Rotation, University of Colorado Boulder	2019.06-2019.07